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Department of
Agriculture

Forest
Service

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Draft Environmental Impact Statement

Park Falls Hardwoods

Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest, Price County, Wisconsin

Townships 37, 38, and 39 North, Range 3 East, 4th Principal Meridian

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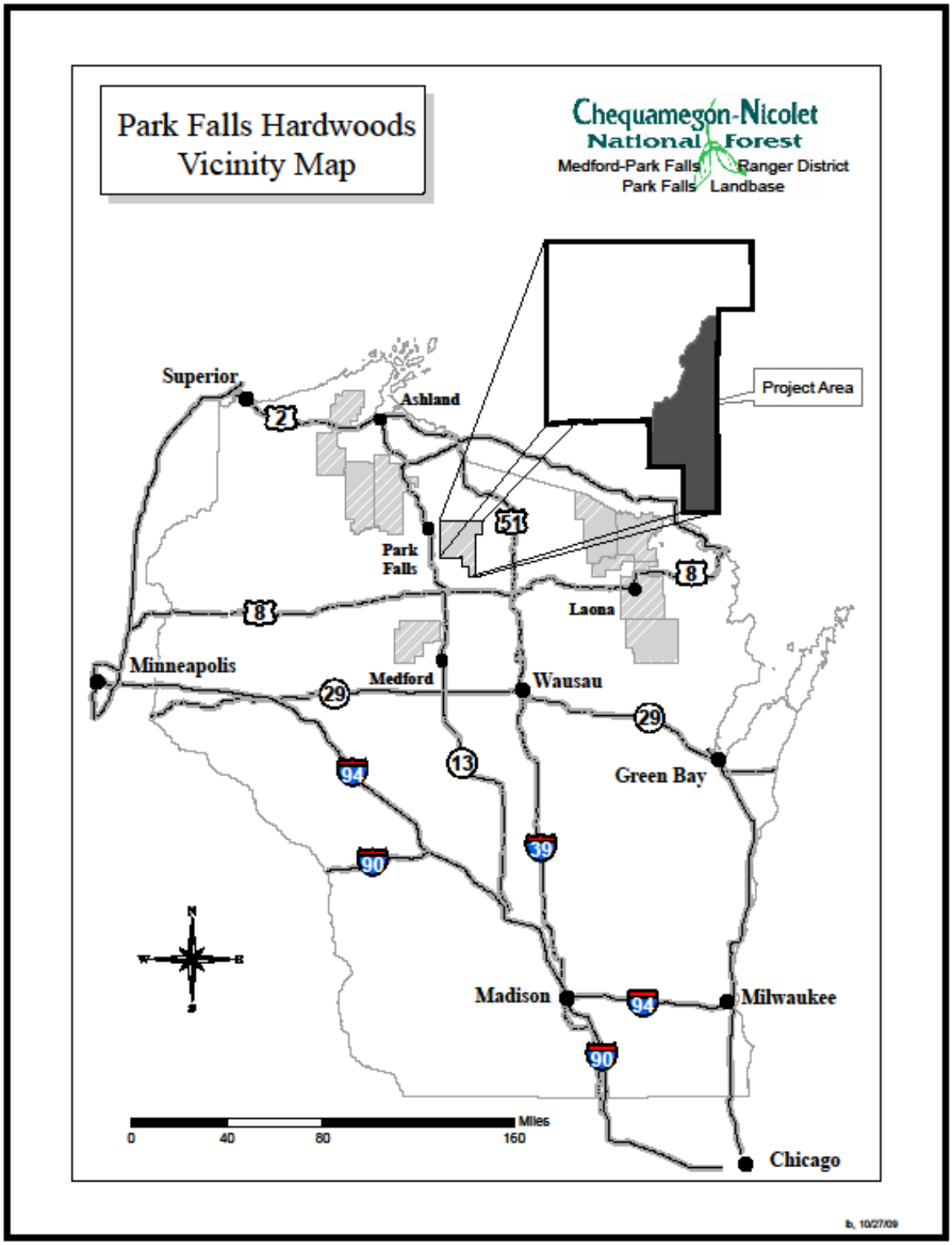
Opportunity to Comment: Comments are invited on this DEIS. To ensure consideration, comments must be postmarked or received by the end of the comments period. The public comment period will end 45 days following the publication date of a notice in the Federal Register. The anticipated date of publication is March 23, 2012. Please check the Federal Register (http://www.gpo.gov/fdsys/browse/collection.action?collectionCode=FR) to verify the actual date of publication.

It is important that reviewers provide their comments at such times and in such a way that they are useful to the Agency's preparation of the EIS. Therefore, comments should be provided prior to the close of the comment period and should clearly articulate the reviewer's concerns and contentions. The submission of timely and specific comments can affect a reviewer's ability to participate in subsequent administrative review or judicial review. Comments received in response to this solicitation, including names and addresses of those who comment, will be part of the public record for this project. Comments submitted anonymously will be accepted and considered; however, anonymous comments will not provide the respondent with standing to participate in subsequent administrative review or judicial review.

Abstract: This draft environmental impact statement presents the results of an analysis of five alternatives, including the no action alternative, for improving and maintaining the health of the forest and associated wildlife species through timber harvest and for maintaining an adequate transportation system for administrative and public access. Most of the project area is located in Forest Plan management area (MA) 2B. The desired landscape in MA 2B is to have a relatively continuous mid to late-successional uneven-aged northern hardwood and northern hardwood-hemlock forest. Large patch conditions and a relatively continuous canopy are to be maintained or recreated with hardwood patch sizes in the thousands of acres. Early successional forest patches are generally allowed to succeed or treated so as to encourage conversion to long-lived species. Landscape heterogeneity is low and habitat fragmentation is minimized. A majority of the upland forest in the area is even-aged hardwoods. The alternatives include varying amounts of harvest treatments (0, 8,722, 8,969, 14,366, and 17,024 acres; Alternatives 1-5 respectively) to maintain or move towards the vegetation conditions described for MA 2B. Most of the treatments in each alternative are selection harvests in hardwoods in order to develop age structure within the area. *The Forest Service preferred alternative is Alternative 5*.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SUMMARY

Introduction and Project Location

The Medford–Park Falls Ranger District of the Chequamegon-Nicolet National Forest is proposing to implement a number of vegetation and transportation management activities (timber harvest, road construction, road decommissioning, etc.), collectively referred to as the Park Falls Hardwoods project and has prepared a draft Environmental Impact Statement (DEIS) in compliance with the National Environmental Policy Act (NEPA). The management activities were developed consistent with management direction in the Chequamegon-Nicolet National Forest 2004 Land and Resource Management Plan (Forest Plan).

This statement discloses the direct, indirect, and cumulative impacts of the proposal and all alternatives developed in detail.

The Park Falls Hardwoods project area (hereafter referred to as project area) is located on National Forest System land in the southeastern portion of the Park Falls unit of the Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest and is approximately 13-15 miles northeast of Phillips, Wisconsin. Vicinity Maps showing the location of the general project area are included following the cover page of this document. The project area falls in portions of the eastern Sections of Township 37 North, Range 3 East; Township 38 North, Range 3 East; and Township 39 North, Range 3 East; Fourth Principal Meridian.

The project area is about 40,687 acres in size of which about 38,598 acres are National Forest. Of the latter, about one third is lowland/wetland and about two thirds is upland (primarily forested).

Why Are We Doing This? (Purpose and Need for Action)

The Organic Act of 1897 established the purposes of the national forests and their management guidance. The National Forest Management Act of 1976 (NFMA) reaffirmed and further defined concepts of multiple use and sustained yield management, emphasizing balanced consideration of all resources through development of Forest Plans. During this planning process, forests are split into zones called “Management Areas” (MAs). Some preserve early successional habitats, and some emphasize forest habitats more similar to pre-European conditions of mixed hardwood and pine forest. The Park Falls Hardwoods project lies in one of the latter.

The Record of Decision (ROD) for the 2004 Forest Plan identifies the Park Falls Hardwoods project area as MA 2B. Vegetation management emphasis in this area is towards relatively continuous mid to late-successional uneven-aged northern hardwood and northern hardwood-hemlock forest. Trees are uneven-aged with older age classes well represented. Management activities are designed to mimic natural wind disturbance mortality, creating small gaps in the canopy to encourage mixed hardwood regeneration. This results in a landscape with large patch conditions and a relatively continuous canopy (Forest Plan pages 3-8 and 3-9). Based on the difference between this MA 2B guidance for the desired vegetative condition and the existing condition of the project area, the need for management activities has been identified.

MA 8E, F, and G are also located in the project area. These MAs have unique or representative vegetation characteristics; they are generally not managed unless a very specific need to do so has been identified. For this project, there have been no specific needs identified for managing the vegetation in the included 8 E, F, and G MAs. There are some travel management projects (primarily road decommissioning) that have been identified as needed within these areas.

Maintain and Improve Forest Health and Vigor

Forest Plan Goal 1.4 is to provide terrestrial ecosystems in healthy, diverse and productive conditions that support the diversity of plant and animal species. To meet that goal, nine needs for vegetation

management have been identified in the Park Falls Hardwoods project area. The forest health component of the Park Falls Hardwoods project is designed to: promote resistance to extreme weather (i.e., wind, drought) and insect and disease outbreaks; increase stand diversity in terms of species, structure, and tree ages; and increase stand growth and vigor by providing space for trees to grow. Healthy forests are more resilient to changing conditions and more resistant to disease, pests, fire, and extreme weather which are stresses that are likely to increase with climate change.

Acquire Data on the Impacts of Selection Harvest on the Atmospheric Flux of Carbon Dioxide (Objective 1): The Forest Service is working with other agencies and scientists to develop strategies for addressing climate change. The Chequamegon Ecosystem-Atmosphere Study (ChEAS) is a multi-organizational research effort studying biosphere/atmosphere interactions within a northern hardwood mixed forest in northern Wisconsin. One of its study sites (Willow Creek tower) is within the project area and baseline data has been collected over a period of years at this site. By continuing the study with a harvest treatment, we will have a better understanding of how our typical hardwood selection treatment may impact the exchange of atmospheric carbon and allow refinement of forest management activities to better respond to global warming issues.

Implement a Treatment Strategy to Reduce or Slow the Spread of Emerald Ash Borer (Objective 2): Emerald ash borer (EAB) is an introduced insect that has the potential to devastate all native ash species similar to what occurred to the American chestnut and American elm. EAB quickly builds its population to a level that leads to mortality of any native ash. While EAB has not been discovered on the Forest, it is likely EAB will be discovered on the CNNF in the next few years. Reducing the amount of potential EAB food source reduces the potential build-up of local EAB populations and provides time to develop treatment strategies that will maintain ash as a component of the forested landscape.

Restore Wind and Disease Damaged Forest to a Productive Forested Condition (Objective 3): There are some acres within the project area that have spruce which has been impacted by spruce decline. Spruce decline is a host of diseases and other stress factors which results in the death of spruce. There is also some aspen in the project area which has been impacted by wind. Salvage and regeneration treatments would return these areas to a healthy, productive forest.

Restore Canada Yew within Northern Hardwoods Ecosystems in MA 2B (Objective 4): Canada yew can be found on the forest; however, individual plants are small, lack vigor, tend to show evidence of deer browsing, and rarely produce fruit. Supplemental planting of yew and prevention of deer browsing at these sites will help in restoration. Both types of treatments have the potential to restore the overall health and vigor of existing Canada yew sites and potentially allow them to reproduce and expand.

Reduce Stocking Levels in Overstocked Forested Stands (Objective 5): Most of the mid to late successional upland forest within the project area is well over the stocking levels prescribed in the Forest Plan to maintain forest health and productivity. Treatments such as thinning and selection harvest reduce the tree stocking to allow for improved health and vigor of the remaining trees (less competition for water/nutrients). Maintenance of prescribed stocking levels would improve resiliency to insects, disease, and other stressors such as anticipated changes in average temperatures, rainfall, and other factors associated with climate change.

Reduce the Amount of Early Successional Forest (primarily aspen) Within the Project Area (Objective 6): The desired percent of aspen for MA 2B is a maximum of 10% of the upland forest. The existing condition is that aspen comprises about 25% of the upland forest type within the project area. In aspen over 35 years old, there is a potential to treat the aspen with a harvest (improvement cut or shelterwood cut) which removes only some of the trees and leaves light conditions on the forest floor that are conducive to regeneration of later successional tree species, moving the area towards the desired condition of less aspen types.

Develop Age Structure in Even-Aged Northern Hardwoods within the Project Area (Objective 7): The majority of the hardwood stands within the project area were established 70 to 80 years ago and are comprised of trees that are all about the same age. For MA 2B, the Forest Plan describes the desired condition for the area as uneven-aged northern hardwood forests. Since, these stands

are already overstocked (as described above) any prescribed selection harvest would also result in development of age structure within the stand and would promote the desired, uneven-aged conditions.

Maintain or Restore Areas of Relatively Continuous Canopy Conditions with Large Patches of Northern Hardwood and Hardwood-Hemlock Forest within the Project Area (Objective 8): Much of the MA 2B hardwood forest of the project area is connected in large blocks. There are some instances where conversion treatments of early successional forest (aspen, birch, fir) to later successional species (hardwoods, spruce, pine, hemlock, oak), could increase the potential for larger patches of the desired forest type. As stated earlier, improvement cuts in early successional forest would move these acres towards later successional species expanding the areas of continuous canopy, hardwood - hemlock forest in the project area.

Maintain Aspen Age Class Distribution (Objective 9): Early successional species are included in the composition objectives for MA 2B. The early successional species that are present in the project area (primarily aspen) are over represented in the older age groups, with limited representation in the youngest age groups (0-10 years of age). Harvesting some of the oldest aspen for regeneration of younger aspen would result in a continued distribution of age groups in whatever early successional habitat is being maintained in the project area.

Improve / Maintain Endangered, Threatened, and Sensitive Species Habitats

Modify Harvest Prescriptions to Enhance Spruce Grouse Habitat (Objective 10): Forest Plan Goal 1.1 is to conserve or restore populations of endangered, threatened, and sensitive species; this project proposes to improve habitat conditions for the Regional Forester Sensitive Species (RFSS), spruce grouse. The habitat for spruce grouse is near the minimum threshold identified for this species; therefore there is a need to increase the amount of habitat where feasible. Improvements to the habitat include developing conifer regeneration or an understory of jack pine, black spruce, or white spruce and reducing those species less desired (balsam fir).

Improve / Maintain Coldwater Fisheries

Modify Harvest Prescriptions to Enhance Coldwater Fisheries (Objective 11): Forest Plan Goal 1.5 is to conserve habitat capable of supporting viable populations of existing native and desired non-native species, and retain the integrity and function of key habitat areas: "…establish a population and distribution of beaver across the forest…..that avoids detrimental effects on cold-water fisheries…:" There are about 23 miles of cold water, native trout streams within the project area. In the areas adjacent to or near cold water streams, the harvest treatments would reduce the amount of aspen (if present), limit aspen regeneration, and encourage the development of long-lived species. This would help improve or maintain vegetation conditions adjacent to streams suitable for coldwater species.

Maintain or Enhance the Quality of Recreation Experience

Designate and Maintain Walking Trails within the Project Area and Limit the Amount of Timber Harvest in MA 6B to that Which can be Completed within a 3-Year Timeframe (Objective 12): Forest Plan Goal 2.1 is to maintain or enhance the diversity and quality of recreation experiences within acceptable limits of change to ecosystem stability and condition; improve the quality of semi-primitive, non-motorized areas by increasing the opportunity for quiet and remote experiences and by promoting activities that provide natural-appearing vegetation. Currently there are no designated non-motorized trails within the project area; designating a specific access to Foulds Creek Spring Ponds would minimize the potential for unwanted impacts to the native trout fishery and provide reasonable public access for non-motorized recreation.

Provide Wood Products to Meet Demand

Utilize Commercial harvest of Forest Projects as the Preferred Tool to Meet Project Area Vegetation Management Needs and Meet Market Demand (Objective 13): Forest Plan Goal 2.5 states that the Forest should contribute toward satisfying demand for wood products through

environmentally responsible harvest. As identified above, there are stands in need of treatment to improve forest health and vigor and to maintain habitat for wildlife. Doing this through a commercial timber harvest allows wood product utilization to meet demand for wood products.

Develop / Maintain Capital Infrastructure

Reduce Total Road Density and Maintain Open Road Density within Limits Established in the Forest Plan, While Maintaining a Safe, Efficient, and Effective Transportation System that Meets Administrative and Public Access Needs (Objective 14): Forest Plan Goal 3.1 is to build and maintain a safe, efficient, and effective infrastructure that supports public and administrative uses of National Forest System lands. The Road Analysis Report (RAP) that was completed for this project found total road densities are slightly above the maximum desired road density level in most of the MA 2B portion of the project area and is under the maximum Forest Plan desired road density in the MA 8E, F, and G areas of the project area. Open road density is currently is well below the maximum range for all portions of the project area. Based on the existing road densities, there is a need to reduce total road density by decommissioning roads that are no longer needed for administrative or public access.

The RAP also looked at unauthorized road segments to see if they could provide administrative access to manage the resources within the project area and to identify resource issues (such as sensitive plant and animals, heritage resources, non-native invasive species, soils, and water). Based on these resource issues, there is a need to limit motorized access to prevent resource damage. These limitations include seasonal restrictions and types of wheeled vehicle access allowed by the public for each road identified as needed for administrative access.

Most logging systems utilized on the Forest are land based using roads to bring in equipment to the harvest area as well as removing product from the area. There are areas where there isn't a road system in place to implement potential harvest. For this reason, some new road construction is needed. In order to meet the need for an adequate road system, permanent and temporary road construction is utilized along with road maintenance and reconstruction.

Public and Interagency Involvement

Opportunities to provide comments regarding the proposed project were provided to other agencies and the public through the process outlined below.

April 2009 – Proposal listed on the Forest's Quarterly Schedule of Proposed Actions (SOPA). This schedule was mailed to parties that have indicated interest in projects that occur on the Forest.

November 19, 2009 - A letter of consultation was sent to 31 Tribal contacts.

January 6, 2010 - A proposed action for the Park Falls Hardwoods project was mailed to 72 individuals, organizations, tribal contacts, and other agencies that have indicated an interest in these types of projects. An additional 354 individuals were sent a letter indicating that the project proposal was available.

January 7, 2010- Newspaper notices about the project appeared in the Park Falls Herald and the (Medford) Star News.

January 10, 2010 - Notice of Intent to prepare an EIS was published in the Federal Register. This notice asked for public comment on the proposal.

Since January of 2010, the proposed action document has been available on the Forest's internet web page, and a project summary continues to appear in the SOPA.

March 2012 – This DEIS is being distributed for comment to individuals and agencies affected by or expressing an interest in the project. Expected date of publication in the Federal Register of the Notice of Availability of the draft is March 23, 2012. A 45 day review and comment period on the DEIS is initiated with that publication.

In response to scoping efforts, about 72 individuals responded to these announcements with requests to be included in further project correspondence and information distribution. About 36 of these included

comments on the proposal. Many of the responses received on the proposal expressed a general like or dislike of the project or specific aspects of the project. Some were a general agreement or disagreement with the Forest Plan direction for the area rather than a specific concern about the impact of the project. Some felt that reduction of aspen and other early successional forest types could adversely impact early successional wildlife species and associated resources, while others feel that there is still too much early successional management in an area set aside for the long term objective of interior hardwood forest. Some commenters expressed an interest in maintaining or increasing the roads available for public motorized access, while others asked us to consider the potential environmental harm that could occur from any increase in roads or increases in roads open to public motorized use. Some wanted alternatives that left most roads open for public use. Other potential impacts to water quality, threatened, endangered, and sensitive species, and other resources were also mentioned.

Issues

Through internal and external scoping of the proposed action, the following significant issues were identified:

Issue 1: Potential impacts to some threatened, endangered or sensitive (rare) plants: Forestry practices include management activities such as harvesting, construction or use of skid trails, haul roads, and other related actions. These actions can cause soil disturbance across stands, increasing the potential for disturbing the duff layer and physically disturbing native vegetation. In the case of American ginseng, roads may also increase the likelihood of illegal harvesting. Changing or removing vegetation could also change other habitat variables (such as light conditions) needed for growth and establishment of rare plants. New road construction also changes suited habitat to unsuited, reducing the acreage of habitat available to some rare plants. Because of their occurrence in the project area and their potential to be impacted by the proposed activities, northern bur-reed, stoloniferous sedge and American ginseng are analyzed in detail.

Issue 2: Potential impacts to some threatened, endangered or sensitive (rare) wildlife: Forestry practices include management activities such as harvesting, construction or use of skid trails, haul roads, and other related actions. These actions can result in changes to habitat that is utilized by wildlife. The activities can disturb wildlife during critical times such as during nesting periods or rearing of young. These changes or disturbances to rare wildlife species can be especially critical because of their already low population densities. Because of their occurrence in the project area or the potential amount of habitat that could be impacted in the project area, northern goshawk, red-shouldered hawk, little brown myotis, northern long-eared myotis, and the tri-colored bat are analyzed in detail.

Issue 3: Potential impacts to game and non-game wildlife that rely on early successional forest types: One of the goals of the Forest Plan is to conserve habitat capable of supporting viable populations of existing native species of wildlife (Forest Plan, page 1-4). The importance of aspen to early successional wildlife species is based on both the long-term maintenance of the aspen type, and the amount of young age aspen. Recent assessments conducted on the Forest indicate a negative trend in the amount of young age class aspen, as well as aspen cover types across the forest (Quinn, et.al, 2006, Quinn and Schmidt, 2007). Even though the purpose and need for the Park Falls Hardwoods project is to decrease the amount of early successional habitat (aspen) within the area, there are some differences between alternatives that could occur in the timing, location, and amount of aspen reductions that could have impacts on early successional wildlife species. A select number of early successional wildlife species are analyzed in detail.

Issue 4: Potential impacts from biomass harvest on various resources: Traditional timber harvests have generally removed only wood greater than four inches in diameter from the bole of a tree. In biomass harvests, where some or all of the material is used as biofuel, all or part of the above ground portion of a tree is removed, including trunk and branches smaller than four inches in diameter. In the Park Falls Hardwoods project, some biomass removal is allowed (not required) in all action alternatives. It is difficult to determine any impacts to species or communities from biomass harvesting, as there is currently a lack of research and a degree of uncertainty on this evolving product extraction. It seems possible that biomass harvesting could reduce small mammal, lichen, and fungi diversity and richness, and possibly allow for increased seedling and herb browse by white-tailed deer. For these reasons,

biomass removal and its potential impacts to wildlife are analyzed. Potential impacts of biomass harvest on other resources (soil, rare species, etc.) are discussed in that particular resource section as applicable.

Issue 5: Potential impacts to soil productivity: Soil disturbance caused by heavy equipment used for harvesting may have negative effects on soil physical, chemical and biological properties and could reduce long-term forest site productivity. Use of heavy rubber-tired or tracked equipment creates risk of soil compaction, rutting, displacement, and erosion. Removal of merchantable tree boles or whole trees (bole plus crown) could affect total site nutrients. If the severity, areal extent, and duration of soil disturbance are great enough to negatively influence the availability of water, nutrients, and oxygen to tree roots, then the ability of a site to sustain productive forest growth could be reduced. These potential impacts as well as soil carbon storage potential are analyzed in detail.

Issue 6: Potential impacts to water quality: The water quality of lakes and streams could be negatively affected as a result of forest management activities if sedimentation were to occur. Erosion is the process by which soil particles are detached and transported. When eroded material is transported and then deposited in water, it is referred to as sediment. Fine sediment is a particular water quality problem in streams because it can reduce: (1) available habitat by filling pools; (2) survival of fish eggs and fry; and (3) survival, composition and abundance of aquatic invertebrates. Sedimentation can also affect channel morphology by increasing width/depth ratio and reducing sinuosity.

Potential effects on fisheries could occur as a result of changes in water quality or loss of habitat through direct stream disturbance or removal of potential sources of large woody debris. Aspen regeneration immediately adjacent to the stream (within 300 to 450 feet) could have an indirect effect on the streams by encouraging beaver colonization which can affect water temperature, sediment transport, and channel morphology. Increases in water temperature of streams and small ponds can occur when the shade that adjacent vegetation provides to the water body is completely removed. The additional sunlight can warm the water by a few degrees, which can cause cold-water communities (that may already be in trouble) to be negatively affected.

Issue 7: Potential impacts to public access: The National Transportation Policy adopted in 2001, provides overall guidance and direction for National Forests to assess road-related access needs and identify opportunities and priorities for future management of the classified road system. A desirable transportation system provides safe access and meets the needs of local communities and forest users; facilitates the implementation of the Forest Plan; allows for economical and efficient management within likely budget levels; meets current and future resource management objectives; and has a minimal impact on natural resources. Although the final roads rule is extensive in providing a comprehensive approach to transportation systems, it did not address the use of off highway vehicles (OHVs). In 2005, in response to the need for development of a consistent national policy, the Forest Service published the Travel Management Rule (TMR), a new rule for providing motor vehicle access (including OHVs) to National Forests and Grasslands. Administrative and public access to the project area are analyzed.

Issue 8: Economic impacts to communities: An economic concern raised is that counties (and local communities) receive a portion of receipts from National Forest activities, such as timber harvest sales. In addition, there is also a potential growing demand for biofuel products, such as topwood from harvested trees. Alternatives with varying amounts of harvest and utilization of wood products could impact local communities and their ability to provide public services such as road maintenance.

Alternatives

To address project objectives and the issues, five alternatives (including a no action alternative) were considered in detail. Alternative 1 is the required “no action” alternative and Alternative 5 is the original proposal. Each of the action alternatives (Alternatives 2-5) respond to one extent or another to the purpose and need for the project as well as all the issues. In Alternatives 2-4, biomass harvest is only allowed in non-hardwood stands and all biomass harvest will be consistent with Wisconsin Forestland Woody Biomass Harvesting Guidelines (BHGs). Alternative 5 also includes biomass harvest (some topwood removal) in hardwood stands. Table S1 shows the projects and treatments by alternative.

In addition to the 5 alternatives analyzed in detail, 5 other alternatives were considered, but dropped from detailed analysis.

Table S1: Treatment/Activity/Volume Summary by Alternative

Treatment	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Harvest Treatments (acres)					
Clearcut	0	260	445	578	449
Overstory Removal	0	160	158	160	160
Shelterwood	0	377	304	377	377
Improvement	0	1,073	1,277	1,035	1,387
Thinning	0	145	126	145	146
Selection	0	6,707	6,659	12,071	14,505
TOTAL (acres):	**0**	**8,722**	**8,969**	**14,366**	**17,024**
Biomass Harvest (acres)	0	0 - 854	0 - 1,045	0 - 1,217	0 - 16,984
Road and Trail Treatments (miles)					
Designated Walking Trails	0	5.7	5.7	5.7	5.7
Permanent Road Construction	0	6.3	7.1	11.4	11.9
Temporary Road Construction	0	1.0	1.4	1.4	1.4
Road Reconstruction / Maintenance	0	10.9	14.4	16.8	17.0
Road Reconstruction (winter)	0	18.2	17.7	22.7	26.2
Road Decommissioning	0	28.9	30.9	28.9	30.9
Other Treatments (acres / sites)					
Supplemental Tree Planting (acres)	0	167	224	264	264
Mechanical Site Preparation (acres)	0	309	304	309	309
Spruce Grouse Habitat Improvement (acres)	0	0	24	52	60
Canada Yew Improvement (sites)	0	5	2	3	6
Coldwater Stream Maintenance / Improvement (acres)	0	216	183	231	294
Forest Products (MMbf* / green tons)					
Sawtimber (MMbf)	0	6	6	11	14
Pulpwood (MMbf)	0	37	39	62	71
TOTAL (MMbf)	**0**	**43**	**45**	**73**	**85**
Biomass (green tons)	0	0 - 3,859	0 - 5,964	0 - 7,545	0 - 30,400

MMbf = million board feet

Alternative 1 (No Action): Under this alternative, none of the activities described in the other action alternatives would occur. Current ongoing management would continue in the project area, including road and trail maintenance, fire suppression, and recreation facility maintenance. Some already planned and approved timber harvest activities (primarily salvage harvest of areas impacted by insect and disease such as spruce decline) would also continue. Because there are no projects associated with this alternative, it does not respond to the defined purpose and need for action.

Alternative 2: Alternative 2 was developed in response to comments concerning the amount of woodland hawk nesting habitat that might be potentially impacted, specifically the species northern goshawk and red-shouldered hawk (Regional Forester Sensitive Species – RFSS). As a result, the following treatments were excluded in this alternative: clearcuts and improvement cuts in 50-65 year old aspen, improvement cuts in 50 year old plus lowland hardwoods, and selection harvest in northern hardwoods that would reduce canopy closure below 80%. This alternative also included less road construction than the proposal (Alternative 5). In addition to the above criteria used for limiting impacts to woodland hawk habitat, isolated harvest areas were dropped from this alternative if they would have required lengthy amounts of road construction to reach.

Alternative 3: One comment letter on the proposed action identified specific criteria for an alternative that they felt would meet their issues and concerns with the proposed action. Alternative 3 was developed in detail based on the suggested criteria. All selection harvest in upland and lowland

hardwood stands over 80 years of age was excluded in this alternative. Vegetation treatments within 124 acres of historic or current northern goshawk nests were also excluded in this alternative. Also, as a result of not harvesting in hardwood stands over 80 years of age, there is less treatment to reduce the ash component in anticipation of a potential emerald ash borer infestation. This alternative also included some additional road decommissioning and less road construction. Isolated harvest areas were dropped from this alternative if they would have required lengthy amounts of road construction to reach.

Alternative 4: Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). Another concern about the proposal was the overall amount of treatment of northern hardwood stands to move them towards an uneven aged condition, and the potential impacts that might occur as a result. Alternative 4 has more aspen clearcutting, less improvement harvest, and less hardwood selection harvest than the proposed action (Alternative 5).

Alternative 5: Alternative 5 is the proposed action described in the January 2010 Notice of Intent and public information package. It was designed to meet the purpose and need for the project and follow Forest Plan standards and guidelines.

Environmental Consequences

Analysis of the environmental consequences showed minimal adverse impacts to the physical, biological, social, and economic environment. Included below is a brief narrative of how each alternative meets specific objectives and the significant issues. Table S2 provides a tabular comparison of selected impacts pertaining to the objectives and issues.

Table S2: Alternative Objective (O) and Issue (I) Comparison Table (Selected Impacts)

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
O1: Potential for Research on Impacts of Selection Harvest	No	No	No	Yes	Yes
O2: % of Stands With an Ash Component Treated to Reduce Ash Density.	0	36	36	66	79
O3: % of Total Amount of Damaged Acres Treated (80 acres)	0	100	95	100	100
O4: % of Total Yew Occupied Stands Treated for Enhancement	0	45	18	27	55
O5: % of Total Amount of Overstocked Acres Treated	0	41	41	73	87
O6: % Reduction of Aspen (15 years following treatment)	2	3	4	3	4
O7: % of Total Even-aged Hardwoods Treated to Develop Age Structure	0	41	40	73	88
O8: % Increase of Mid to Late Successional Forest (15 years following treatment)	3	6	6	5	6
O9: % of Aspen, 0-10 Years Old (Existing %=11, Desired %=20)	4	8	12	13	12
O10, I2: Spruce Grouse Habitat Improvement (acres)	0	0	24	52	60
O10, I2: Spruce Grouse Habitat Loss (acres)	0	18	18	18	18
O11, I2: % of Trout Stream Buffers Treated to Reduce Aspen	0	10	8	10	13
O12, I7: Foulds Creek Trail (Miles)	0	0.8	0.8	0.8	0.8
O12, I7: Elk River Walking Trial (Miles)	0	4.9	4.9	4.9	4.9
O13, I8: Harvest Volume (MMbf – million board feet)	0	43.6	45.5	73.2	84.9
O13, I8: Biomass Volume (up to X green tons)	0	3,859	5,964	7,545	30,400
O14, I7: Project Area Total Road Density – miles per square mile	3.2	2.8	2.7	2.8	2.8
O14, I7: Project Area Open Road Density – miles per square mile	1.0	1.3	1.3	1.3	1.3
I1: Northern Bur-reed - % of Suitable Habitat Available	100	>99	>99	>99	>99
I1: Stoloniferous Sedge - % of Suitable Habitat Available	100	>99	>99	>99	>99

Table S2: Alternative Objective (O) and Issue (I) Comparison Table (Selected Impacts)					
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
I1: American Ginseng - % of Suitable Habitat Available	100	>99	>99	>99	>99
I2: Unoccupied Northern Goshawk Nesting Habitat Available in Project Area Immediately Following Harvest (as a % of current)	+1.2	+1.1	-21.0	-35.3	-40.7
I2: Unoccupied Northern Goshawk Nesting Habitat Available in Project Area 5 Years Following Harvest (as a % of current)	+3.0	+3.0	+1.7	+1.7	+1.7
I2: Unoccupied Red-shouldered Hawk Nesting Habitat Available in Project Area Immediately Following Harvest (as a % of current)	+0.7	+0.4	-19.3	-33.1	-38.5
I2: Unoccupied Red-shouldered Hawk Nesting Habitat Available in Project Area 5 Years Following Harvest (as a % of current)	+1.7	+1.7	+1.7	+1.7	+1.7
I2: Little Brown Myotis, Northern long-eared Myotis, and Tri-colored **b**at - % of Suitable Habitat Available	100	>99	>99	>99	>99
I3: Early Successional Wildlife Habitat: 0-10 Year Old Aspen (5 years following harvest) – Acres	239	436	626	705	626
I4: Total Biomass (FWD) Remaining in All Harvested Stands (Total Generated + Existing - Removed) (dry tons)	NA	71,603	72,855	117,859	125,664
I4: Average Biomass (FWD) Remaining in Harvested Stands (Total Remaining / Harvest Treatment Acres) (dry tons / acre)	NA	8.2	8.1	8.2	7.4
I4: % Change From Existing Condition	NA	+174	+171	+173	+146
I5: % of Soil Resource that Remains Productive	>99	98	98	98	98
I6: Acres of Tree Harvest in Water Body RMZ (out of 867 acres)	0	68	68	65	86
I8: $ Available to Counties (sawtimber and pulpwood) (to nearest thousand)	0	475	491	798	929
I8: $ Available to Counties from Biomass (up to X $) (to nearest thousand)	0	1	2	3	11

Objective 1 - Acquire data on the impacts of selection harvest on the atmospheric flux of carbon dioxide in order to better understand and mitigate impacts of climate change. In Alternatives 1, 2, and 3, there would be no selection harvest of the area within the footprint of the ChEAS tower. The selection harvest was not included in Alternatives 2 and 3 because it did not meet the criteria used to develop those alternatives. In Alternatives 4 and 5, there is proposed selection harvest in the footprint of the tower. The continued research with harvest treatments could provide detailed data needed for carbon cycle and climate change modeling activities. This could allow refinement of forest management activities to better respond to global warming issues. It is unlikely that research of this nature would occur in Alternatives 1, 2, or 3.

Objective 2 – Implement a treatment strategy to reduce or slow the spread of emerald ash borer (EAB): Alternative 5 has the least risk for spread of EAB based on the amount of treated acres and the juxtaposition of treated areas to untreated areas and their spatial locations. Spatially the treated areas are located throughout the entire analysis area and provide isolation of “unprotected areas” such as 8E, 8F, 8G and 6B MAs. As a comparison, the action alternative which appears to leave more unprotected ash on the landscape is Alternative 3. Although Alternatives 2 and 3 treat similar acreages, spatially, the configuration of untreated stands in Alternative 3 appears to show more EAB risk potential because of the connectivity of the untreated stands. Alternative 1, the No Action Alternative, does not meet the need for increasing resiliency to an EAB infestation. In Alternative 1, EAB (once established) would be expected to move quickly throughout the project area and widespread mortality of ash could be expected within five years of an infestation.

Objective 3 – Restore wind and disease damaged forest to a productive, more resilient forested condition: Areas within the project area that have been impacted by spruce decline or wind are proposed for treatment in all the action alternatives. Salvage and regeneration treatments would return these areas to a healthy, productive forest. Alternatives 2, 4, and 5 meet this need on 100% of damaged acres and Alternative 2 meets it for 95%. Alternative 1 (No Action) would not treat any of the damaged areas.

Objective 4 - Restore Canada yew within northern hardwoods ecosystems in MA 2B: There would be no negative direct or indirect effect to Canada yew from any alternative. In all action alternatives, logging slash will be strategically placed over and around existing sites and the slash barriers will be monitored to

evaluate their effectiveness at affording Canada yew protection from deer browse. In Alternatives 4 and 5, planting and subsequent fencing of planted yew would have a direct positive effect. In Alternatives 1, 2, and 3 Canada yew would likely continue to exist in the project area at very low numbers. Unfenced yew would likely remain in a browsed state and would not reproduce.

Objective 5 – Reduce stocking levels in overstocked forest stands to provide a more resilient forested condition: Selection harvesting, commercial thinning and overstory removal treatments in overstocked stands will improve the health and vigor of the forest which in turn increases resilience from stressors such as drought, disease, and insect infestation. Alternatives 4 and 5 meet this need by treating most of the acres that are in an overstocked state. Alternatives 2 and 3 meet this need on less than half of the acres, and Alternative 1 does not meet this need.

Objective 6 - Reduce the amount of early successional forest (primarily aspen) within MA 2B to meet objectives for large blocks of continuous canopy, northern hardwood forest: All alternatives move the project area closer to the desired amount of aspen. Within a 15 year period, the projected percentage reduction of aspen in the MA 2B is 2 to 4% depending on the alternative. Alternatives 3 and 5 reduce the amount of aspen by an amount that is about double of what natural succession would accomplish. Also, it should be noted that the aspen specifically treated for conversion in each alternative already has a vegetation component that makes conversion likely within 15 years. Any natural succession conversions of aspen would just be starting in 15 years. For this reason, the action alternatives are more likely to reach the desired condition within the noted 15 year time frame.

Objective 7 - Develop uneven age structure in even-aged northern hardwoods within MA 2B: All the action alternatives address the project need to develop uneven-aged northern hardwoods. Alternative 5 treats about 88% of the northern hardwoods that are in an even-aged condition. The remaining hardwood stands that are untreated in Alternative 5 are too young or the stocking level is too low to implement a selection harvest. Alternative 4 treats about 73% of northern hardwoods. Alternatives 2 and 3 treat about 40% of the northern hardwoods. Alternative 1 does not meet the need for moving northern hardwood stands from an even to an uneven-aged condition.

Objective 8 - Maintain or restore areas of relatively continuous canopy conditions with large patches of northern hardwood and hardwood-hemlock forest within MA 2B: All alternatives move the project area closer to the desired condition of continuous canopy and large blocks of northern hardwood forest. Alternatives 2, 3, and 5 respond to this need with a 6% increase in later successional species. Alternative 4, responds with a 5% increase and Alternative 1 (No Action) with a 3% increase. As noted previously, the stands identified for conversion treatments already have a vegetation component that makes conversion to later successional forest likely within 15 years.

Objective 9 - Maintain aspen age class distribution within the aspen type: While there is an overabundance of early successional species in the project area, the early successional species that are present are over represented in the older age groups, with limited representation in the youngest age groups (0-10 years of age). In managing early successional species, an even distribution across age groups is called for in the Forest Plan. Alternatives 3, 4 and 5 all move closer to the Forest Plan's desired condition for aspen age class distribution about equally. In Alternatives 1 and 2 the youngest age class moves further from the Forest Plan desired condition which is the result of aspen that ages into the 11-20 year age class and the limited amount of aspen being recruited into the 0-10 year age class.

Objective 10 (Issue 2) - Modify harvest prescriptions to enhance spruce grouse habitat: Enhancement of spruce grouse habitat is proposed in Alternatives 3, 4, and 5. This consists of planting black spruce in lowland hardwood stands proposed for harvest adjacent to lowland conifer wetland complexes and a portion of one stand that will emphasize retention of white spruce and reduction of balsam fir "thickets" during harvesting. There will be no direct or indirect impact to spruce grouse because there will be no impact to the area of spruce grouse sighting in 2007 and any minimal reduction in habitat (18 acres) is offset by habitat enhancement in most action alternatives. Alternative 2 is the only alternative that does not offset the 18 acres of long term habitat loss with habitat enhancement, and this loss only represents 0.7% of the suitable habitat. Overall, the spruce grouse habitat enhancement in Alternatives 3, 4, and 5 results in a very slight increase in habitat in the project area over the long term. Alternative 1 does not change the habitat over the long term.

Objective 11 - Modify harvest prescriptions to enhance coldwater fisheries: Alternative 1 is not pro-active in reducing aspen and retaining long lived species that would be less palatable to beaver near coldwater fisheries. Alternatives 2-5 are pro-active in converting some acres away from early successional species to long-lived species, reducing the impacts from beaver over the long term. Based on the amount of the trout buffer zones treated in each action alternative there is little difference in how each meets the objective of improving trout fisheries. Because of ongoing road maintenance projects, all the alternatives will continue to reduce potential for sedimentation impacts to brook trout and other fisheries.

Objective 12 - Designate and maintain walking trails within the project area and limit the amount of timber harvest in MA 6B to that which can be completed within a 3-year timeframe: The trail designations are the same for all action alternatives: Foulds Creek Trail, 0.8 miles and Elk River Walking Trail, 4.9 miles. In Alternative 1 (No Action) no trails would be designated. The amount of timber harvest in MA 6B is limited to that which can be completed within a 3-year timeframe in all action alternatives.

Objective 13 - Utilize commercial harvest of forest products as the preferred tool to meet project area vegetation management needs and meet market demand: All the action alternatives would make more timber and biomass available for harvest than currently exists. While Alternative 5 allows for the harvest of 84.9 MMbf and Alternative 2 allows for 43.6 MMbf, the combined CNNF timber sale program is expected to remain within the range of the last seven years of 70-80 MMbf per year. The Medford-Park Falls Ranger District share of this overall program has been about 11-15 MMbf per year. Regardless of the action alternative selected it is anticipated that harvest levels will remain steady across the District and Forest as a whole. This means that the expected social and economic effects would remain unchanged from the current condition. Selection of an alternative that provides a higher volume of timber and biomass products would provide additional stability to the District sale program and purchasers of federal timber and biomass, in that the locations and approximate quantities of the next five plus years of timber sales would be known and all associated environmental analysis would be complete. Alternative 5 is unique out of all the alternatives in the amount of biomass harvest. In Alternative 5, almost all the acres treated with a harvest prescription would be available for removal of a portion of the tree tops. The other alternatives limit biomass harvest to non-hardwood areas. Alternative 5 could have about 6 times the biomass harvest volume than alternatives 2 and 3, and about 4 times the volume of Alternative 4. Based on the recently emerging demand for biomass in the Price County area specifically, this difference may or may not be significant for meeting the objective for demand of this product.

Objective 14 - Reduce total road density and maintain open road density within limits established in the Forest Plan, while maintaining a safe, efficient, and effective transportation system that meets administrative and public access needs: Implementing Alternatives 2-5 in Park Falls Hardwoods project would be a further reduction in total road density already underway on the Chequamegon-Nicolet National Forest, and movement toward overall Forest goals for road density. Alternatives 2-5 increase open road density in the project area from what is displayed on the 2009, 2010, and 2011 CNNF Motor Vehicle Use Map (MVUM); however, the cumulative impact is still a reduction in open road density based on the Forest Plan FEIS published levels, and all action alternatives provide continued movement toward overall Forest goals for open road density.

What is not illustrated by the amount or length of roads decommissioned or constructed is that when implementation is complete, the future transportation system, would provide for an improved spatial arrangement of roads on the landscape. The addition of newly constructed roads within the project area in Alternatives 2-5 is more than offset by the levels of decommissioning.

Issue 1: Potential impacts to some threatened, endangered or sensitive (rare) plants: Because of their known occurrence and/or abundant suitable habitat in the project area; northern bur-reed, stoloniferous sedge and American ginseng are Regional Forester Sensitive Species (RFSS) that have the potential to be impacted by the proposal and alternatives. For northern bur-reed, project design features such as winter harvest are expected to maintain habitat suitability for this species, so most of the habitat (> than 99%) would remain suitable in all action alternatives (Alternatives 2-5). Impacts to individual plants or plant colonies are not expected in any alternative.

For stoloniferous sedge, 19 acres, or less than 1/10 of a percent of suitable (unoccupied) habitat would become unsuitable habitat in all the action alternatives (Alternatives 2-5). Impacts to individual plants or

plant colonies are not expected in any alternative. More than 99% of the currently suitable habitat in the project area would remain suitable for stoloniferous sedge.

For American ginseng, 19 acres, or about 1/10 of a percent of suitable (unoccupied) habitat would become unsuitable habitat in all the action alternatives (Alternatives 2-5). Impacts to individual plants or plant colonies are not expected in any alternative. About 99% of the currently suitable habitat in the project area would remain suitable for American ginseng.

Issue 2: Potential impacts to some threatened, endangered or sensitive (rare) wildlife: Because of their occurrence in the project area or the potential amount of habitat that could be impacted in the project area, northern goshawk, red-shouldered hawk, little brown myotis, northern long-eared myotis, tri-colored bat, and spruce grouse were identified as the significant Regional Forester Sensitive Species that could be impacted by the proposal and/or alternatives. See Objective 10 for a summary of potential impacts to spruce grouse. For the woodland hawk species, there is currently no occupied habitat that would be impacted in any alternative. There are no known red-shouldered hawk nests in the project area. Based on impacts to unoccupied habitat, it was determined that Alternatives 1 and 2 would have no impact on these hawks and the determinations for Alternatives 3, 4, and 5 are “may impact individuals, but there would be no impact on population viability for this species”. This determination was made primarily from the acres of suitable nesting habitat that would become unsuitable for 5 years following treatment. For Alternatives 3, 4, and 5, habitat for the RFSS hawks is expected to increase under all of the Park Falls Hardwoods alternatives within 5 years of harvest by 1.7%, with a substantial decrease in suitable habitat (about 20-40%) immediately following harvest in Alternatives 3-5. In all alternatives, there is still more than 11,000 acres of suitable nesting habitat immediately following harvest activity which will increase to about 20,000 within 5 years, which is slightly more than the current amount of nesting habitat available. For the 3 bat species, there is little difference between alternatives with more than 99% of foraging and roosting habitat maintained in all alternatives.

Issue 3: Potential impacts to game and non-game wildlife that rely on early successional forest types: One of the goals of the Forest Plan is to conserve habitat capable of supporting viable populations of existing native species of wildlife (Forest Plan, page 1-4). The importance of aspen to early successional wildlife species is based on both the long-term maintenance of the aspen type, and the amount of young age aspen. All alternatives represent a permanent loss of some habitat for ruffed grouse, woodcock and golden-winged warbler from the reduction in total amount of aspen. However, the amount of young aspen (0-10 years old) actually increases in Alternative 4 from the current condition (663 acres), while Alternatives 1 and 2 show a marked decrease. Alternatives 3 and 5 are about the same as the existing condition for the amount of aspen that will be 0-10 years old in the area. The amount of alder and upland openings is static for the short term, with the acres of upland openings declining over the long term. Though there is a loss of some early successional habitat in all alternatives, for the overall project area this represents a change in less than 1% of the total upland acres for all cover types into or out of early successional habitat from the current condition.

Issue 4: Potential impacts from biomass harvest on various resources: Traditional timber harvests have generally removed only wood greater than four inches in diameter from the bole of a tree. In biomass harvests, trunks and branches smaller than four inches in diameter could be harvested. Harvest of this material could impact small mammals, lichen, and fungi diversity and richness, and possibly allow for increased seedling and herb browse by white-tailed deer. Alternative 1 (No Action) would not have any biomass removed or added to the forest floor through harvest operations. It is estimated that there is currently about 3 dry tons per acre of fine woody debris (FWD) that is present and would remain in in Alternative 1. Alternatives 2 through 5 would collectively have almost triple the FWD component in comparison to the existing condition. Because of the amount of biomass harvest allowed in Alternative 5 (addition of biomass harvest in hardwood selection harvests), it is not quite triple the existing component of fine woody debris. Even assuming the worst case scenario for amount of FWD that could be crushed (50%) and not providing maximum wildlife habitat value, there is still more FWD deposited on average in each of the action alternatives compared to the existing condition and what would be present in the No Action alternative. From the research that is currently available, leaving more woody debris on site is better than less for many wildlife species.

Issue 5: Potential impacts to soil productivity: Because no actions are being taken in Alternative 1, there is no soil disturbance or detrimental soil disturbance projected. Alternatives 2 through 5 all have some detrimental soil disturbance occurring, but the cumulative impact is the same for each alternative with respect to the percentage of the soils resource being maintained in a productive state (98% maintained).

Issue 6: Potential impacts to water quality: Because no actions are being taken in Alternative 1, there are no impacts to the aquatic resource. Alternatives 2-5 have a range of 65-86 acres that fall within the Riparian Management Zone (RMZ) with Alternative 5 having the most. Impacts are not likely in these zones due to the implementation of applicable standards and guidelines related to water quality.

Issue 7: Potential impacts to public access: See the transportation Objective 14 and Objective 12 for walking trails.

Issue 8: Economic impacts to communities: Because there is no timber harvest in Alternative 1, there would be no revenue from the sale of wood products and no payments to counties generated from this project. In the action alternatives there is a range of potential revenue, volume, jobs, and receipts that increases from Alternative 2 to 5. Alternatives 2 and 3 are similar in the economic measures, both producing about the same amount of revenue, volume, jobs, and receipts, while Alternatives 4 and 5 are also very similar and close to double the revenues and volumes available in Alternatives 2 and 3. Because timber sale contracts are implemented over a period of years, these impacts would be realized over a period of years following approval of any of the alternatives. Actual impacts to communities such as a loss of revenues from National Forest timber sales may not occur in any of the alternatives depending on the availability of other harvest volume that is unassociated with this project.

Decisions to be Made

This draft environmental impact statement (DEIS) is not a decision document. Its main purpose is to disclose the environmental consequences of implementing the proposed action or the alternatives to that action (inform the decision maker) and provide a basis for involving the public.

The responsible official for the Park Falls Hardwoods decision will be the District Ranger of the Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest. The scope of the decision to be made is limited to:

Will the project be implemented as proposed, through the selection of one of the alternatives or through a combination of alternatives, and

What project design features, mitigation measures, and monitoring requirements are needed, if any?

*CHAPTER 1 – PURPOSE AND NEED FOR ACTION_*

Introduction

The Forest Service has prepared this draft environmental impact statement (DEIS) in compliance with the National Environmental Policy Act (NEPA) and other relevant federal and state laws and regulations. This document discloses the direct, indirect, and cumulative environmental impacts that would result from implementation of the proposed action and alternatives for the Park Falls Hardwoods project. Additional documentation, including more detailed analyses of project-area resources, may be found in the project file which is referenced throughout this document.

Location

The project area is located on the Park Falls unit of the Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest (Forest), approximately 13-15 miles northeast of Phillips, Wisconsin. The legal description for the area is: portions of the eastern Sections of Township 37 North, Range 3 East; Township 38 North, Range 3 East; and Township 39 North, Range 3 East; Fourth Principal Meridian. A Vicinity Map of the Park Falls Hardwoods project area is located immediately following the cover page of this document. Additional maps of the project area can be found in Appendix G.

The overall project area is about 40,700 acres in size of which about 38,600 acres are National Forest.

Proposed Action

The primary purpose of this proposal is to implement activities consistent with direction in the 2004 Chequamegon-Nicolet National Forests Land and Resource Management Plan (Forest Plan) and respond to specific needs identified in the project area. Briefly, the proposed action (Alternative 5) includes about 17,024 acres of various harvest treatments with the majority of treatments being hardwood selection harvest, about 264 acres of supplemental tree planting, about 11.9 miles of permanent road construction, about 1.4 miles of temporary road construction, about 43.2 miles of road reconstruction or maintenance, about 30.9 miles of road decommissioning, and about 5.7 miles of walking trail designation. The proposed action (Alternative 5) is described in detail in Chapter 2 of this document. Maps that display treatments, treatment tables, and tables that display applicable Forest Plan standards and guidelines and project specific design features for each of the alternatives are included in Appendices E, F, and G. All acreage and mileage figures are approximate.

Project Area History

In order to place the proposal and the need for the proposal in context, a brief history of the management of the Forest is given in this section. The National Forests in Wisconsin are comprised of the Nicolet National Forest and the Chequamegon National Forest. Both were proclaimed as National Forest in the 1930's, and at that time looked much different than they do now.

Pre-National Forest: As glaciers receded from these lands many thousands of years ago (10,000-20,000 years before present), vegetation gradually replaced the ice. As the climate warmed, the initial tundra vegetation succeeded into the modern conifer and hardwood species we are familiar with today, and by the end of the 1600's, most of the upland and lowland areas were dominated by forest cover of maple, ash, hemlock, yellow birch, white pine and cedar. Periodic natural and human disturbance maintained some shrub lands, aspen, paper birch and red pine on this landscape. By the mid-1800's, Europeans began to settle in the area, clearing forests for wood products and farming. By the beginning of the 20th century, the face of the landscape had changed from one dominated by mature forest, to one dominated by non-forested lands.

National Forest: Because of the undesirable condition of these lands, they became the "lands that nobody wanted" and in the late 1920s and early 1930s, the federal government bought large areas of

these non-forested lands to restore. It was during this time period that the Park Falls unit became part of the Chequamegon National Forest. Initial efforts of federal management were aimed at restoration of forests, controlling water flow and suppressing wildfire. Tree planting dominated early efforts, and was so successful that within a few decades, most of the lands were back to forest again. The newly established forests were much younger than the average forest of 1600, and the proportion of early successional species was higher. As these and other forests developed into maturity, there was increasing public and management concern about the sustainability of these forests and the potential resource impacts that could occur as a result of managing them. These concerns led to many of the current environmental laws and regulations controlling National Forest management. By 1986, the Chequamegon National Forest had adopted a Forest Plan to assure that any future management would comply with the legal framework for protecting the National Forest resource.

History under the Forest Plans: Since 1986, all forest management has occurred under the direction of a Forest Plan. By 1986 the project area was dominated by mixed hardwood forests that were starting to mature (55 to 60 years old) interspersed with some early successional forest such as aspen and paper birch. It was shortly following development of the 1986 Forest Plan that the public, resource specialists, and scientists became concerned about the overall biodiversity of the Chequamegon and Nicolet National Forests and how their management affected it. In 1992, the Chequamegon and Nicolet National Forests convened a "scientific roundtable" of experts to assess ways in which the biological diversity of the Wisconsin National Forests could best be protected or enhanced and recommendations for management to protect biological diversity were developed (1994,USDA Forest Service, General Technical Report NC-166). These recommendations were taken into consideration as site specific activities occurred on the Forests until the Forest Plans were revised, at which time they were taken into consideration in the planning process and in the development of the 2004 Forest Plan. Portions of the Park Falls Hardwoods project area were of particular concern because the area represented a landscape (maturing hardwood forest) that was considered to be important in protecting the biological diversity of the forest.

From 1986 to present, very little forest management has occurred in the Park Falls Hardwoods project area. What has occurred has been primarily related to salvage and restoration activity as a result of natural events such as wind storms, ice storms, fire, and forest disease. Some areas that were starting to develop from early successional forest species towards later successional hardwoods were set back by these events, but the overall landscape in the project area has remained a maturing, hardwood dominated landscape with interspersions of early successional forest such as aspen and paper birch and mid successional forest such as red pine and white spruce. A map showing the general vegetation cover type and the underlying land type association can be found in Appendix G.

Current Forest Plan Direction and Existing Conditions

The Park Falls Hardwoods project area is comprised of several different Forest Plan management areas (MAs) which are described in this section.

Table 1: Project Area Acres and Square Miles by Management Area (MA)

	MA	Square Miles(NM)	Total Acres	NM Acres
Research Natural Area or Candidate	8E	3.1 (0)	1969	0
Special Management Area	8F	2.4 (1.5)	1528	961
Old Growth or Special Features Complex	8G	0.9 (0)	607	0
	Total 8E, F, G	**6.4 (1.5)**	**4,104**	**961**
2B (Uneven-aged Northern Hardwoods)	2B	36.7 (0)	23,486	0
2B and Semi-Primitive, Non-motorized	2B/6B	5.4 (5.4)	3,454	3,454
2B and Non-motorized	2BNM	11.8 (11.8)	7,543	7,543
	Total 2B/6B/NM	**53.9 (17.2)**	**34,483**	**10,997**
Total Forest System Land		**60.3 (18.7)**	**38,587**	**11,958**
Other Ownership		3.3	2,089	N/A
Total, All Ownerships		**63.6**	**40,676**	**N/A**

Table 1 summarizes the project area acres and square miles by these MAs. A map with the MA locations within the project area along with other features of the project area is included in Appendix G of this document. In Table 1, NM indicates non-motorized which is not a Forest Plan MA, but is a designation for public motorized use in addition to the MA prescription. As a summary, the majority of the project area falls in MA 2B and about 1/3 of the MA 2B area is to be managed for non-motorized recreation.

Management Area 2B: The desired landscape in MA 2B is to have a relatively continuous mid to late-successional uneven-aged northern hardwood and northern hardwood-hemlock forest. Large patch conditions and a relatively continuous canopy are to be maintained or recreated with hardwood patch sizes in the thousands of acres. Early successional forest patches are generally allowed to succeed or treated so as to encourage conversion to long-lived species. Landscape heterogeneity is low and habitat fragmentation is minimized.

A map showing the general vegetation cover type and the underlying land type association can be found in Appendix G. The land type association is featured on this map to show how it affects the overall pattern of the vegetation. For instance, while MA 2B is to be managed primarily for large blocks of hardwood forest (in the thousands of acres in size), the actual capability to manage for these large blocks may be governed or limited by the underlying LTA. Land Type Associations are ecological units delineated on similar patterns of glacial landforms, topography, soil complexes and associated patterns of vegetation and succession, within climatic regions. They are characterized in detail for their geology, soils, disturbance patterns, historical/existing and potential vegetation, hydrology, fauna, and other ecological attributes. These LTA characteristics (i.e. soils, geology, disturbance patterns, etc.) influence the landscape pattern and the varying degree of edge/interior ratio, large and small patches and the resulting fragmentation seen on the landscape. As an example, the overall size of the upland and lowland features in the northern portions of the project area (LTA 212Xb01 and LTA 212Xa03) are smaller and have a more broken pattern than those in the southern portion of the project area (LTA 212Xa01 and LTA 212Xd02).

The long term desired condition for vegetation in MA 2B is to have an overstory dominated by sugar maple, hemlock, and yellow birch in the northern hardwood-hemlock forest community; or sugar maple, basswood, white ash and yellow birch in the northern hardwood forest community. Hemlock is to be the most common conifer, but white pine is a component. Trees are to be uneven-aged with older age classes well represented. Multiple tree sizes are emphasized. Some old growth component characteristics are maintained or restored and a component of large trees is left to create tip-ups, snags and coarse woody debris. Standing and down coarse dead wood material is common.

Table 2 shows the current condition of the upland forest type (24,098 acres) in MA 2B along with the desired condition for this MA.

Table 2: Upland Acres and Percentages for MA 2B within the Project Area

UPLAND TYPE	EXISTING ACRES	EXISTING %	DESIRED %
aspen	**6049**	**25**	**0-10**
fir	258	1	0-3
birch	495	2	0-2
jack pine	0	0	0-2
red/white pine	78	<1	0-10
northern hardwoods	16510	69	50-80
oak	184	<1	0-3
openings	97	<1	0-1
other upland forest types	427	<2	0-15

While northern hardwoods are dominant in the project area, Table 2 shows that the amount of aspen exceeds the desired amount for MA 2B. Another aspect of the MA 2B theme is to have uneven-aged

forest dominating the landscape. The existing condition in the project area is that most of the forest is even-aged, including the northern hardwood component.

Management Area 6B: MA 6B is characterized by early, mid, and late successional hardwood and aspen forests located within a semi-primitive, non-motorized setting. Lake and stream cold and warm water fishing, cross country skiing, mountain biking, hiking, hunting, and primitive camping are the primary recreation activities. MA 6B is managed for a low interaction between users. This management prescription is used in conjunction with the underlying management prescription. In other words, the area with this MA designation would still be managed for the desired MA 2B vegetation conditions, but would have some additional guidance to maintain a semi-primitive, non-motorized setting for public access and recreation. Motorized access is allowed for administrative use and management of these areas, but timber harvest is limited to no more than one-half of the upland acres within a planning period to insure that the semi-primitive recreation opportunity is maintained. The proposed action and other alternatives were developed to meet this condition by primarily deferring any harvest needs to the east of the Elk River.

Non Motorized: In development of the Forest Plan, there was a need identified to provide some additional non-motorized recreation opportunities that were not necessarily tied to a primitive or semi-primitive recreation experience setting. In other words, there were some areas identified in the Forest Plan as non-motorized as far as public access, but user interaction could be moderate to high instead of low as in the 6B prescription. In the area designated as non-motorized within the Park Falls Hardwoods project area, the underlying 2B prescription would be applied, but public motorized access is restricted to provide a non-motorized recreation experience.

Management Area 8E: MA 8E is characterized by ecologically significant natural features, representative ecosystems, and/or unique areas managed as Candidate or Existing Research Natural Areas. A broad representation of forest community types is included in this MA. In combination with other RNAs in the nation, they form a national network of ecological areas for research, monitoring, education, and maintenance of biological diversity.

Management Area 8F: MA 8F is characterized by unique areas of physical, biological, and cultural features of Forestwide or Regional significance. Included are examples or representatives of scenic, historical, geological, botanical, zoological, paleontological, and archeological values. Management emphasizes the protection of these values and opportunities for public use and interpretation. Special MAs (SMAs) may also provide opportunities as reference sites for research and monitoring.

Management Area 8G: MA 8G is characterized by ecosystem complexes and scattered individual stands which feature existing or developing old growth forest, as well as other exemplary natural communities. The MA may serve as a benchmark or reference area for use in monitoring, adaptive management, or research.

Because MA 8E, F, and G have unique or representative vegetation characteristics, they are generally not managed unless a very specific need to do so has been identified. For this project, there have been no specific needs identified for managing the vegetation in the included 8 E, F, and G MAs. There are some travel management projects (primarily road decommissioning) that have been identified as needed within these areas.

Transportation / Roads: In addition to Management Area direction, the Forest Plan provides guidance for a desired transportation system. The roads in Park Falls Hardwoods project area provide access for recreation, timber harvest, hunting, fishing, gathering, general multi-purpose, and private property access. The Forest Plan provides limits for open and total road densities across the Forest and within specific MA designations. Within the project area, the Forest Plan desired condition for total road density is expected to be 3 miles per square mile or less. The desired open road density is expected to be 2 miles per square mile or less. Within the two non-motorized areas, the desired open road density is 0 miles per square mile while the total road density limit remains at 3 miles per square mile. In 8E, F, and G areas, road density is expected to be similar to the surrounding area. Total road densities within portions of the project area are close to or exceeding Forest Plan desired conditions.

Purpose and Need for Action

The need for action (why we are proposing these actions) comes from the differences between the existing condition of the project area and the conditions that are desired for the project area. In general, the Forest Plan provides the desired outcomes for the area by identifying goals and assigning a Management Area (MA) designation. For example, the theme or goal for MA 2B is for Uneven-aged Northern Hardwoods: Interior Forest (Forest Plan, pages. 3-7 through 3-11). The desired condition is to have a relatively continuous, mid to late-successional, uneven-aged forest dominated by northern hardwood and northern hardwood-hemlock communities. A relatively continuous canopy is maintained or created, resulting in large patch conditions (Forest Plan, page. 3-8). One specific aspect of the MA 2B theme is to have uneven-aged forest dominating the landscape. The existing condition in the Park Falls Hardwoods project area is that most of the forest is even-aged. This difference between the desired and existing condition can be addressed by proposing vegetation management projects that have the potential to change the forest towards an uneven-aged condition.

Through examination of the existing conditions of the project area, six major needs for action have been identified based upon Forest Plan goals and objectives and other Forest Service direction:

Need to Improve / Maintain Forest Health

Forest Plan Goal 1.4 – Provide terrestrial ecosystems in healthy, diverse and productive conditions that support the diversity of plant and animal species: Nine needs for vegetation management have been identified in the Park Falls Hardwoods project area. The forest health component of the Park Falls Hardwoods project is designed; to promote resistance to extreme weather (i.e., wind, drought) and insect and disease outbreaks; increase stand diversity in terms of species, structure, and tree ages; and increase stand growth and vigor by providing space for trees to grow. Healthy forests are more resilient to changing conditions and more resistant to disease, pests, fire, and extreme weather which are stresses that are likely to increase with climate change.

Acquire Data on the Impacts of Selection Harvest on the Atmospheric Flux of Carbon Dioxide: The Chequamegon Ecosystem-Atmosphere Study (ChEAS) is a multi-organizational research effort studying biosphere/atmosphere interactions within a northern mixed forest in northern Wisconsin. A primary goal of ChEAS is to understand the processes controlling forest-atmosphere exchange of carbon dioxide and the response of these processes to climate change. Another of ChEAS's primary goals is to bridge the gap between canopy-scale flux measurements and the global CO2 flask sampling network. One of its study sites (Willow Creek tower) is within the project area and baseline data has been collected over a period of years at this site. In fact, the Willow Creek site showed the strongest carbon sink of all the towers (with no recent harvest treatments). By continuing the study with a harvest treatment, we will have a better understanding of how our typical hardwood selection treatment may impact the exchange of atmospheric carbon and allow refinement of forest management activities to better respond to global warming issues. The location of the Willow Creek flux tower (ChEAS tower) can be found on the Management Areas, ChEAS Tower and Streams/Rivers Map in Appendix G.

The Forest Service is working with other agencies and scientists to develop strategies for addressing climate change. Two key strategies for addressing climate change include "adaptation" and "mitigation". Adaptation relates to the ability of a system to adjust to climate change, be resistant and resilient to potential damages, to take advantage of opportunities, or cope with consequences. Mitigation includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks. By understanding the relationship of various harvest activities to atmospheric carbon flux, those activities can be designed to reduce release of greenhouse gases and increase or enhance sinks.

Implement a Treatment Strategy to Reduce or Slow the Spread of Emerald Ash Borer: Emerald ash borer (EAB) is an introduced insect that has the potential to devastate all native ash species similar to what occurred to the American chestnut and American elm. Without native control organisms, emerald ash borer quickly builds its population to a level that leads to mortality of any native ash. Once established, we can expect the first dead trees to begin to show in about 4 years. After about 6 years, mortality should be approaching 100%. While EAB has not been discovered on the Forest, it is likely EAB will be discovered on the CNNF in the next few years. Control options for EAB are extremely limited.

Insecticide options are available but they are very costly, labor intensive and require re-treatment every other year, making this type of treatment infeasible for general forest use. In order to slow the potential spread of EAB, and the subsequent mortality of ash (and the potential replacement by a less desirable species), there is a need to treat both upland and lowland hardwoods with an ash component. Silvicultural treatments that are designed to enhance the growth of non-ash species or regenerate non-ash species can decrease the impacts when EAB does arrive. Treatments designed to decrease the amount of ash will be most effective if these treatments are applied well before EAB infestations are present. These treatments can be done during normal timber sale treatments where ash exists. Removal of the largest ash in the stand has the most benefit as the largest ash provide the greatest amount of phloem (EAB feeding area) while maintaining the ash genetics within the stand by reserving the more plentiful smaller ash stock. For addition information see Ash Management Strategy for the Chequamegon-Nicolet National Forest and the June 5, 2009 Memo for implementation (USDA Forest Service, 2009a).

Reducing the amount of potential EAB food source reduces the potential build-up of local EAB populations. This should delay the death of ash as they are not overwhelmed by high EAB populations. There may be benefits in the delay, such as, determining a level of resistance in some ash while giving natural (or introduced) predators, parasites and diseases time to build-up and provide some level of EAB population control. This strategy is needed now because to have an impact, treatment needs to occur well in advance of EAB infestation.

Restore Wind and Disease Damaged Forest to a Productive Forested Condition: There are some acres within the project area that have spruce which has been impacted by spruce decline (about 62 acres). Spruce decline is a host of diseases and other stress factors which results in the death of spruce. There is also some aspen in the project area which has been impacted by wind (about 18 acres). Salvage and regeneration treatments would return these areas to a healthy, productive forest.

Restore Canada Yew within Northern Hardwoods Ecosystems in MA 2B: Based on monitoring, new occurrences of Canada yew continue to be documented on the forest; however, individual plants are small, lack vigor, tend to show evidence of deer browsing, and rarely produce fruit. Out of 12 new sites found in the project area in 2007, 8 sites were heavily browsed. In order to restore Canada yew with the current deer populations, some form of deterrent is needed. Since existing yew populations are generally small, fencing (deer exclosures around the plants) of sites is a feasible option to restore the plants to a fruit bearing stage. Supplemental planting of yew at these sites will also help in restoration. Since deer exclosures are somewhat cost prohibitive, there is the potential to protect yew plants from browsing by strategic placement of slash to deter the deer. Both types of treatments have the potential to restore the overall health and vigor of existing Canada yew sites and potentially allow them to reproduce and expand.

Reduce Stocking Levels in Overstocked Forested Stands: The project area is an area that has had minimal active management for the last 2 1/2 decades. For the most part, vegetation management has occurred as a result of natural events such as wind damage, ice damage, and insect and disease. Most of the mid to late successional upland forest within the project area is well over the stocking levels prescribed in the Forest Plan to maintain forest health and productivity. Treatments such as thinning and selection harvest reduce the tree stocking to allow for improved health and vigor of the remaining trees (less competition for water/nutrients). There are also areas of the forest that have a well developed understory of a desired species, and the overstory is suppressing the understory. Removal of the overstory will allow the desired understory to develop. By keeping or maintaining the desired stocking levels in these stands, these forested acres will also be better equipped to maintain resiliency to insects, disease, and other stressors such as anticipated changes in average temperatures, rainfall, and other factors associated with climate change.

Reduce the Amount of Early Successional Forest (primarily aspen) Within the Project Area: For MA 2B, Chapter 3 of the Forest Plan identifies a desired condition for aspen of a maximum of 10% of the upland forest. The existing condition is that aspen comprises about 25% of the upland forest type in MA 2B within the project area. Aspen, an early successional species, is maintained naturally through catastrophic events such as wind and ice storms or maintained through management techniques such as clearcutting or overstory removal cuttings. As a result of past management and catastrophic events in the project area, there is more of this early successional species than desired. Over very long periods of time

and without catastrophic events, aspen will eventually be replaced by later successional tree species such as mixed northern hardwoods. In aspen over 35 years old, there is a potential to treat the aspen with a harvest which removes only some of the trees and leaves light conditions on the forest floor that are conducive to regeneration of later successional tree species. These types of treatments (improvement cut or shelterwood cut) – with or without underplanting - would nudge the understory in the desired direction making it less likely that the stand would regenerate back to aspen when the overstory aspen dies off through natural or other means.

Develop Age Structure in Even-Aged Northern Hardwoods within the Project Area: The majority of the hardwood stands within the project area were naturally established 70 to 80 years ago and are comprised of trees that are all about the same age. For MA 2B, Chapter 3 of the Forest Plan describes the desired condition for the area as mid to late successional , uneven-aged northern hardwood forests. As even-aged hardwoods mature and individual trees die, they may start to build an uneven age structure on their own. However, these stands are already overstocked (as described above) and selection harvest would not only improve overall health, vigor, and resiliency, it would also result in development of age structure within the stand and would promote the desired, uneven-aged conditions.

Maintain or Restore Areas of Relatively Continuous Canopy Conditions with Large Patches of Northern Hardwood and Hardwood-Hemlock Forest within the Project Area: Much of the hardwood forest within the MA 2B portion of the project area is connected in large blocks. There are some instances, particularly in the southern portion of the project area, where treatment of early successional forest to convert it to later successional species, could increase the potential for larger patches of the desired forest type (hardwoods, spruce, pine, hemlock, oak) while simultaneously reducing the less desired forest type (aspen, birch, fir). As stated earlier, improvement cuts in early successional forest would move these acres towards later successional species. As hardwood types increase in these areas, this will also expand the areas of continuous canopy, hardwood - hemlock forest in the project area.

Maintain Aspen Age Class Distribution: The bulk of early successional stands that are proposed for management will be managed to promote mid to late successional species, but there are some early successional stands that are still desired and that would be maintained in early successional species. While there is an overall overabundance of early successional species in the project area, the early successional species that are desired are currently overrepresented in the older age groups, and underrepresented in the younger age groups. The Forest Plan, when managing for early successional species, calls for an even distribution of age groups across the landscape. For this reason, some of the older aspen stands will be harvested with the intent of regenerating younger aspen in some areas, without breaking up larger hardwood blocks. This will produce a more even age class distribution of the early successional species that would be maintained in the project area and provide habitat for a variety of wildlife species that utilize young forest as their primary habitat or for maintaining habitat utilized by their prey.

Need to Improve / Maintain Endangered, Threatened, and Sensitive Species Habitats

Forest Plan Goal 1.1 – Conserve or restore populations of endangered, threatened, and sensitive species: Improve habitat conditions for Regional Forester Sensitive Species, Spruce Grouse.

Modify Harvest Prescriptions to Enhance Spruce Grouse Habitat: The habitat for spruce grouse as identified by the Forest Plan is near the minimum threshold identified for this species; therefore there is a need to increase the amount of habitat for this species where feasible. The project area contains some habitat for spruce grouse which could be improved / expanded within areas identified for treatment. Improvements to the habitat include developing conifer regeneration or an understory of jack pine, black spruce, or white spruce and reducing those species less desired (balsam fir). For this reason, several proposed treatments have been modified to retain or expand habitat elements important to spruce grouse.

Need to Improve / Maintain Coldwater Fisheries

Forest Plan Goal 1.5 – Wildlife and Fish Habitat; Conserve habitat capable of supporting viable populations of existing native and desired non-native species, and retain the integrity and function of key habitat areas: "…establish a population and distribution of beaver across the forest…..that avoids detrimental effects on cold-water fisheries…:"

Modify Harvest Prescriptions to Enhance Coldwater Fisheries: There are about 30 miles of cold water and / or native trout streams within the project area. These are the Thunder Creek system, Little Willow system, Elk River system, Sieverson Creek, Silver Creek, and the Foulds Creek system. Beaver activity (primarily feeding or utilization of aspen close to these streams) results in lack of shade trees adjacent to the stream and potentially leads to increases in water temperature, making it unsuitable for cold water species. There are several treatments being proposed that would be adjacent to some of these streams. In these areas (adjacent to or near cold water streams), the harvest treatments would be modified to reduce the amount of aspen (if present), limit aspen regeneration, and encourage the development of long-lived species. This would lessen the potential for future beaver activity and the consequent impacts to coldwater streams.

Need to Maintain or Enhance the Quality of Recreation Experience

Forest Plan Goal 2.1 Maintain or enhance the diversity and quality of recreation experiences within acceptable limits of change to ecosystem stability and condition: Improve the quality of semi-primitive, non-motorized areas by increasing the opportunity for quiet and remote experiences and by promoting activities that provide natural-appearing vegetation.

Designate and Maintain Walking Trails within the Project Area and Limit the Amount of Timber Harvest in MA 6B to That Which Can Be Completed Within a 3-Year Timeframe: The Foulds Creek spring ponds have long been utilized as a recreational fishery. The spring ponds have a system of old roads that are no longer utilized for motorized access that could be converted to walking trails, which would provide access to the fishery. Designating a specific access for foot travel would minimize the potential for unwanted impacts to the native trout fishery. Also, there are currently no designated non-motorized trails within the project area. More specifically, the MA 6B portion (semi-primitive, non-motorized) has no designated hiking trails. This area receives use from wildflower viewers, hunters, and other recreationists. Designation of a hiking trail in the 6B area would provide reasonable public access for non-motorized recreation. Also, in the 6B portion of the project area, the Forest Plan calls for completing harvest planned for any decade in a consecutive 3-year period in order to meet acceptable limits of change for semi-primitive recreation settings. For this reason, any proposed harvest within the 6B portion of the project area is limited to the amount of harvest that could reasonably be expected to be accomplished within a 3 year period.

Need for Supplying Wood Products

Forest Plan Goal 2.5 – Contribute toward satisfying demand for wood products and special forest products through environmentally responsible harvest on National Forest System lands:

Utilize Commercial Harvest of Forest Products as the Preferred Tool to Meet Project Area Needs: Most of the activities being proposed to meet the need for action would result in the availability of wood products, including pulpwood, sawtimber, and topwood/biomass. Based on past transactions, there is a demonstrated demand for these types of wood products, making commercial timber harvest the preferred tool for accomplishing vegetation treatments, including treatments needed for maintenance and improvements to the road and trail systems. Current demand for biomass is low but might rise in the Park Falls area of the Forest because of its proximity to the proposed Flambeau River Biofuels Plant. Wisconsin's forestry community has recognized an emerging interest in wood-based bio-energy and the need for harvesting guidelines to ensure that woody biomass harvest is ecologically sustainable and does not compromise the long-term productivity of forestland. Because utilization of topwood for biomass is a newer market, any harvest of topwood would not be a required component of commercial activities, but would be available on request.

Need to Develop / Maintain Capital Infrastructure

Forest Plan Goal 3.1 – Build and maintain safe, efficient, and effective infrastructure that supports public and administrative uses of National Forest System lands. Retain and progress toward the Forestwide average total road density goal of 3.0 miles per square mile established in 1986:

Reduce Total Road Density and Maintain Open Road Density Within Limits Established in the Forest Plan, While Maintaining a Safe, Efficient, and Effective Transportation System that Meets Administrative and Public Access Needs: Based on information in the RAP (Road Analysis Report) for the Park Falls Hardwoods project, total road densities are slightly above the maximum desired road density in some portions of the project area. More specifically, total road density is above the desired level in most of the MA 2B portion of the project area and is under the maximum Forest Plan desired road density in the MA 8E, F, and G areas of the project area. Open road density is currently within the desired range of the Forest Plan objectives for all portions of the project area. Based on the existing road densities, there is a need to look for opportunities to reduce total road density within the project area. This would be accomplished by proposing to decommission roads that are no longer needed for administrative or public access.

Also based on the RAP, there is a need to keep some of these unauthorized roads in order to administratively manage the resources within the project area. The RAP also looked at each specific road segment to identify resource issues (such as sensitive plant and animals, heritage resources, non-native invasive species, soils, and water). Based on these resource issues, there is a need to limit motorized access to prevent resource damage. These limitations include seasonal restrictions and types of wheeled vehicle access allowed by the public for each road identified as needed for administrative access.

Most logging systems utilized on the Forest are land based using roads to bring in equipment to the harvest area as well as removing product from the area. There are areas where there isn't a road system in place to implement potential harvest. For this reason, some new road construction is needed. Some vegetation treatment areas would not need treatment again for forty or more years, while others need more regular entry to maintain Forest Plan objectives. Those areas that need to be entered on a regular basis would need a permanent road system. Because there has been little management activity in the project area within the last 2 decades, many of the existing access routes are in need of maintenance or reconstruction in order to utilize them for harvest and/or public access activities. In order to meet the need for an adequate road system for administrative access, permanent and temporary road construction is needed along with road maintenance and reconstruction.

Table 3 shows the existing road densities in the project area along with the Forest Plan upper desired limits.

Table 3: Existing and Desired Road Densities by MA

UPLAND	EXISTING MILES (Total/Open)	EXISTING DENSITY – Miles per Sq Mile (Total/Open)	PLAN DENSITY UPPER LIMIT – Miles per Sq Mile (Total/Open)
Project Area	190/66	3/1	NA
MA 2B	124/49	3/1	3/2
MA 2B/6B	21/1	4/0	3/0
MA 2B/NonMotorized	31/0	3/0	3/0
MA 8E	6/2	2/1	3/2
MA 8F	5/0	1/0	3/2 or 3/0
MA 8G	3/0	3/0	3/2

Decision Framework

The main purpose of an Environmental Impact Statement is to disclose the environmental consequences of implementing the proposed action or the alternatives to the action (inform the decision maker) and provide a basis for involving the public. This draft statement was prepared on the premise that certain decisions must be made and documented in a forthcoming Record of Decision (ROD). Accordingly, this document focuses on providing sufficient analysis to make a decision about which alternative to implement.

This environmental impact statement is tiered to the 2004 Forest Plan, Plan FEIS, and Plan ROD. The ROD for the Forest Plan included decisions about general management direction for an area. Impacts of the general management direction were disclosed in the Plan FEIS. This document looks at the impacts that may be different from or in addition to what was already disclosed in the Plan FEIS and are generally related to the specific location of the proposed management activities.

The responsible official for the Park Falls Hardwoods decision will be the District Ranger of the Medford-Park Falls Ranger District, Chequamegon-Nicolet National Forest. Based on the analysis in the final Environmental Impact Statement (EIS), the District Ranger will decide:

Will the project be implemented as proposed, through the selection of one of the alternatives or through a combination of alternatives, and

What project design features, mitigation measures, and monitoring requirements are needed, if any?

Public Involvement

The Council on Environmental Quality (CEQ) defines scoping as, ". . . an early and open process for determining the scope of the issues to be addressed and for identifying the significant issues related to a proposed action (40 CFR 1501.7)." Among other things, the scoping process is used to invite public participation, to help identify concerns and issues (impacts), to help identify a reasonable range of alternatives, and to obtain public comment at the various stages of the EIS analysis process. Scoping begins early and is an iterative process that continues until a decision has been made by the responsible official. Opportunities to provide comments regarding this proposed project were provided to other agencies and the public through the process outlined below:

In April, 2009 a notice was first listed on the Forest's Quarterly Schedule of Proposed Actions (SOPA). This schedule was mailed to parties that have indicated interest in projects that occur on the Forest and is available on the World Wide Web at http://www.fs.fed.us/sopa/forest-level.php?110913.

On November 19, 2009 a letter of consultation was sent to 31 Tribal contacts including Tribal Chairs, Tribal Historic Preservation Officers (THPO), Voigt Intertribal Taskforce representatives, Great Lakes Indian Fish and Wildlife Commission (GLIFWC), and other contacts.

On January 10, 2010 a Notice of Intent to prepare an EIS was published in the Federal Register. This notice asked for public comment on the proposal.

A proposed action for the Park Falls Hardwoods project was mailed to 72 individuals, organizations, tribal contacts, and other agencies that have indicated an interest in these types of projects. An additional 354 individuals were sent a letter indicating that the project proposal was available on the World Wide Web or that we would mail a copy on request if they were interested in commenting on the proposal. The proposal and notices were sent January 6, 2010.

Newspaper notices about the project and requesting comments appeared in the Park Falls Herald and the (Medford) Star News on January 7, 2010.

Since January of 2010, the proposed action document has been available on the Forest's internet web page, and a project summary continues to appear in the SOPA.

About 72 individuals responded to these announcements with requests to be included in further project correspondence and information distribution. About 36 of these included comments on the proposal.

Many of the responses received on the proposal expressed a general like or dislike of the project or specific aspects of the project. Some were a general agreement or disagreement with the Forest Plan direction for the area rather than a specific concern about the impact of the project. Some felt that reduction of aspen and other early successional forest types could adversely impact early successional wildlife species and associated resources, while others feel that there is still too much early successional management in an area set aside for the long term objective of interior hardwood forest. Some commenters expressed an interest in maintaining or increasing the roads available for public motorized access, while others asked us to consider the potential environmental harm that could occur from any increase in roads or increases in roads open to public motorized use. Some wanted alternatives that left most roads open for public use.

Some commenters had very specific requests such as keeping a particular road open to motorized use, or requests for introduction of elk in the project area, or requests for additional motorized trails in the area. Some of the requests are outside the jurisdiction of the Forest Service (introduction of elk), or are outside of the purpose and need for the project (increase the amount of aspen and other early successional species).

While impacts to water quality, threatened, endangered, and sensitive species, and other resources were mentioned, they were not tied specifically to the actions or locations of the actions that were proposed. Many of the commenters expressed a general agreement or disagreement with the proposal. These types of comments were generally addressed through different alternatives that provide more or less of a specific action to meet overall project objectives.

Appendix D contains all comments received on the proposal along with a response and how the comment was used or addressed in this analysis.

Issues / Objectives

Issues are defined as points of disagreement, debate, or dispute with the proposed action; they articulate a cause-effect relationship of effects to the proposed action.

This section includes a brief summary of the significant issues and objectives for the Park Falls Hardwoods project, as determined from project scoping and review by the responsible official. The primary difference between an objective and a significant issue is that an objective describes or leads to an intentional impact on the environment based on the purpose and need for the project, whereas a significant issue generally describes an impact that is unavoidable or unintentional and could occur as a result of project implementation. Because both are descriptions of impacts, they are studied in similar detail and are the basis for the environmental impacts described in Chapter 3 of this document.

Other issues that do not appear in this section of the document were raised during project scoping. These other issues (one's that vary little by alternative or issues that have been addressed by Forest Plan standards and guidelines or additional mitigation measures and result in no or minimal impacts) are documented in Appendix C along with a brief description of the issue and why it was not studied in detail. The Council for Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations direct agencies to make this distinction in 40 CFR 1501.7….."Determine the scope and the significant issues to be analyzed in depth" and "Identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review". While these issues and concerns are not to be discounted, they were not relevant to the proposed actions, or they were not relevant for alternative comparison or making a decision about which alternative to implement. See Appendix C for further information on non-significant issues and how they are addressed.

The following objectives and significant issues for this project were used to generate alternatives to the proposal, formulate mitigation or project design measures that would reduce potential impacts, or identify project monitoring needs. Each is covered in Chapter 3 of this document. Objectives 1 through 9 meet the need for maintaining and improving vegetation health. The other objectives each meet a specific need as identified earlier in this chapter.

> Objective 1 - Acquire data on the impacts of selection harvest on the atmospheric flux of carbon dioxide in order to better understand and mitigate impacts of climate change.

Objective 2 – Implement a treatment strategy to reduce or slow the spread of emerald ash borer.

Objective 3 – Restore wind and disease damaged forest to a productive, more resilient forested condition.

Objective 4 - Restore Canada yew within northern hardwoods ecosystems in MA 2B.

Objective 5 – Reduce stocking levels in overstocked forest stands to provide a more resilient forested condition.

Objective 6 - Reduce the amount of early successional forest (primarily aspen) within MA 2B to meet objectives for large blocks of continuous canopy, northern hardwood forest.

Objective 7 - Develop age structure in even-aged northern hardwoods within MA 2B.

Objective 8 - Maintain or restore areas of relatively continuous canopy conditions with large patches of northern hardwood and hardwood-hemlock forest within MA 2B.

Objective 9 - Maintain aspen age class distribution within the aspen type.

Objective 10 - Modify harvest prescriptions to enhance spruce grouse habitat.

Objective 11 - Modify harvest prescriptions to enhance coldwater fisheries.

Objective 12 - Designate and maintain walking trails within the project area and limit the amount of timber harvest in MA 6B to that which can be completed within a 3-year timeframe.

Objective 13 - Utilize commercial harvest of forest products as the preferred tool to meet project area vegetation management needs and meet market demand.

Objective 14 - Reduce total road density and maintain open road density within limits established in the Forest Plan, while maintaining a safe, efficient, and effective transportation system that meets administrative and public access needs.

Issue 1 - Potential impacts to some threatened, endangered or sensitive (rare) plants: Forestry practices include management activities such as harvesting, construction or use of skid trails, haul roads, and other related actions. These actions can cause soil disturbance across stands, increasing the potential for disturbing the duff layer and physically disturbing native vegetation. New road construction may affect rare species and native vegetation by adversely impacting the physical environment where native plants grow. In the case of American ginseng, roads may also increase the likelihood of illegal harvesting. New road construction also changes suited habitat to unsuited, reducing the acreage of habitat available to some rare plants. Because of their occurrence in the project area and their potential to be impacted by the proposed activities, Regional Forester Sensitive Species (RFSS) northern bur-reed, stoloniferous sedge, and American ginseng are analyzed in detail in Chapter 3. Canada yew, a Forest Plan Management Indicator Species (MIS) is also analyzed in Chapter 3 because of the objective to improve habitat for this species in the project area (Objective 4).

Issue 2 - Potential impacts to some threatened, endangered or sensitive (rare) wildlife: Forestry practices include management activities such as harvesting, construction or use of skid trails, haul roads, and other related actions. These actions can result in changes to habitat that is utilized by wildlife. The activities can disturb wildlife during critical times such as during nesting periods or rearing of young. These changes or disturbances to rare wildlife species can be especially critical because of their status. Because of their occurrence in the project area or the potential amount of habitat that could be impacted in the project area, northern goshawk, red-shouldered hawk, little brown myotis, northern long-eared myotis, and the tri-colored bat are analyzed in detail in Chapter 3. Spruce grouse, another Regional Forester Sensitive Species (RFSS) was also analyzed in detail in Chapter 3 because of the objective to improve habitat for this species in the project area. Brook trout, a Forest Plan indicator species is also analyzed in Chapter 3 because of the objective to improve cold water fisheries (Objective 11).

Issue 3 - Potential impacts to game and non-game wildlife that rely on early successional forest types: One of the goals of the Forest Plan is to conserve habitat capable of supporting viable

populations of existing native species of wildlife (Forest Plan, page 1-4). The importance of aspen to early successional wildlife species is based on both the long-term maintenance of the aspen type, and the amount of young age aspen. Recent assessments conducted on the Forest indicate a negative trend in the amount of young age class aspen, as well as aspen cover types across the forest. Even though the purpose and need for the Park Falls Hardwoods project is to decrease the amount of early successional habitat (aspen) within the area, there are some differences between alternatives that could occur in the timing, location, and amount of aspen reductions that could have positive impacts on early successional wildlife species. A select number of early successional wildlife species (ruffed grouse, white-tailed deer, American woodcock, and golden-winged warbler) are discussed in detail in Chapter 3.

Issue 4: Potential impacts from biomass harvest on various resources: There are several overall biodiversity concerns related to timber harvesting. Timber harvesting has the potential to lead to less complexity in both structural diversity and tree species type diversity. Stands with a mix of tree species and tree and shrub height diversity are often used by a variety of game and non-game wildlife species. Traditional timber harvests have generally removed only wood greater than four inches in diameter from the bole of a tree. In biomass harvests, where some or all of the material is used as biofuel, all or part of the above ground portion of a tree is removed, including trunk and branches smaller than four inches in diameter. In the Park Falls Hardwoods project, some biomass removal is allowed in all action alternatives. It is difficult to determine any impacts to species or communities from biomass harvesting, as there is currently a lack of research and a degree of uncertainty on this evolving product extraction. It seems possible that biomass harvesting could reduce small mammal, lichen, and fungi diversity and richness, and possibly allow for increased seedling and herb browse by white-tailed deer. For these reasons, biomass removal and its potential impacts to wildlife are analyzed in Chapter 3. Potential impacts of biomass harvest on other resources (soils, water, rare species, etc.) are discussed in that particular resource section of Chapter 3 as applicable.

Issue 5: Potential impacts to soil productivity: Soil disturbance caused by heavy equipment used for harvesting may have negative effects on soil physical, chemical and biological properties and could reduce long-term forest site productivity. Use of heavy rubber-tired or tracked equipment creates risk of soil compaction, rutting, displacement, and erosion. Removal of merchantable tree boles or whole trees (bole plus crown) could affect total site nutrients. If the severity, areal extent, and duration of soil disturbance are great enough to negatively influence the availability of water, nutrients, and oxygen to tree roots, then the ability of a site to sustain productive forest growth could be reduced. These potential impacts as well as soil carbon storage potential are analyzed in detail in Chapter 3.

Issue 6: Potential impacts to water quality: The water quality of lakes and streams could be negatively affected as a result of forest management activities if sedimentation were to occur. Erosion is the process by which soil particles are detached and transported. When eroded material is transported and then deposited in water, it is referred to as sediment. Fine sediment is a particular water quality problem in streams because it can reduce: (1) available habitat by filling pools; (2) survival of fish eggs and fry; and (3) survival, composition and abundance of aquatic invertebrates. Sedimentation can also affect channel morphology by increasing width/depth ratio and reducing sinuosity.

Potential effects on fisheries could occur as a result of changes in water quality or loss of habitat through direct stream disturbance or removal of potential sources of large woody debris. Aspen regeneration immediately adjacent to the stream (within 300 to 450 feet) could have an indirect effect on the streams by encouraging beaver colonization which can affect water temperature, sediment transport, and channel morphology. Increases in water temperature of streams and small ponds can occur when the shade that adjacent vegetation provides to the water body is completely removed. The additional sunlight can warm the water by a few degrees, which can cause cold-water communities (that may already be in trouble) to be negatively affected. Potential impacts to watersheds and cold water streams are discussed in Chapter 3.

Issue 7: Potential impacts to public access: The National Transportation Policy adopted in 2001, provides overall guidance and direction for national forests to assess road-related access needs and identify opportunities and priorities for future management of the classified road system. A desirable transportation system provides safe access and meets the needs of local communities and forest users; facilitates the implementation of the Forest Plan; allows for economical and efficient management within likely budget levels; meets current and future resource management objectives; and has a minimal impact on natural resources. Although the final roads rule is extensive in providing a comprehensive approach to transportation systems, it did not address the use of off highway vehicles (OHVs). In 2005, in response to the need for development of a consistent national policy, the Forest Service published the Travel Management Rule (TMR), a new rule for providing motor vehicle access (including OHVs) to National Forests and Grasslands. Administrative and public access to the project area are analyzed in Chapter 3.

Issue 8 - Economic impacts to communities: An economic concern raised is that counties (and local communities) receive a portion of receipts from National Forest activities, such as timber harvest sales. In addition, there is also a potential growing demand for biofuel products, such as topwood from harvested trees. Alternatives with varying amounts of harvest and utilization of wood products could impact local communities and their ability to provide public services such as road maintenance from receipts from National Forest activities.

Relevant Laws, Regulations, and Policies

This document has been prepared in compliance with the National Environmental Policy Act (NEPA) and its implementing regulations at 40 CFR Parts 1500-1508. NEPA at 40 CFR 1502.025(a), directs "to the fullest extent possible, agencies shall prepare environmental impact statements concurrently with and integrated with…other environmental review laws and executive orders." The following laws, regulations, executive orders, and Forest Service Policies pertain to the management activities proposed in the Park Falls Hardwoods project.

National Forest Management Act and Chequamegon-Nicolet National Forests 2004 Land and Resource Management Plan (Forest Plan): The National Forest Management Act of 1976 (Section 6(g) (3), (e) (iv), and (f) (i)) and resulting regulations (36 CFR 219.15) require that vegetation management practices meet the objectives and requirements of the Forest Plan. This project has been designed according to direction in the 2004 Forest Plan. In order to eliminate repetitive discussion and documentation, this document tiers to the Forest Plan and its Final EIS and Record of Decision. All upland stands proposed for harvest have been inventoried and are suited for timber production. The proposal and alternatives call for some harvest of lowland hardwoods. These are improvement cuts designed to reduce the density of ash within the area to slow the potential for rapid spread of emerald ash borer. None of the timber harvest occurs in areas that have been withdrawn from timber harvest by an act of Congress, by the Secretary of Agriculture, or by the Chief of the Forest Service. There are no wilderness areas, roadless areas, or designated or candidate wild and scenic rivers within the project area.

Endangered Species Act of 1973, as amended 1978, 1979, 1982, and 1988 (16 U.S. C. 1531): This Act provides direction to the Forest Service to establish objectives for habitat management and recovery through the Forest Plan for the conservation and protection of endangered and threatened species. The Endangered Species Act requires federal agencies to "… implement a program to conserve fish, wildlife, and plants . . . to insure their actions do not jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of critical habitat." This project is consistent with the Forest Plan and is therefore consistent with these guidelines. In March 2008, the U.S. Fish and Wildlife Service provided an updated list of federally listed threatened and endangered species present on the Chequamegon-Nicolet National Forest. Other species experts were also consulted to ensure the most updated information regarding species was considered. All federally listed species so identified were considered in the biological evaluation for this project. There is no critical habitat present in the project area. For additional information on endangered species and the analysis of impacts, see Appendix C of this document and the Project File (Draft Biological Evaluation, Park Falls Hardwoods DEIS, June 2011, and supporting files).

Regional Forester Sensitive Species: Forest Service policy requires completion of biological evaluations (BEs) of programs and activities and to analyze adverse effects on populations or habitat of species with viability concerns. The Forest Service Manual (FSM 2670.15) defines sensitive species as those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trend in numbers, density or habitat capability that would reduce a species' existing distribution. An analysis of potential impacts on Regional Forester Sensitive Species (RFSS) was conducted and documented in a biological evaluation for the Park Falls Hardwoods Project. State-listed species are not addressed in this document or the biological evaluation unless they are also considered a Regional Forester Sensitive Species, in which case they are discussed in the biological evaluation with findings summarized in Chapter 3 and Appendix C of this document as appropriate.

Management Indicator Species (MIS): The Chequamegon-Nicolet National Forest 2004 Land and Resource Management Plan (Forest Plan) identifies seven Management Indicator Species that are required to be monitored on a yearly basis and evaluated every five years (Plan page 4-6, Table 4-1). These seven species are bald eagle, eastern timber wolf, northern goshawk, red-shouldered hawk, American marten, brook trout, and Canada yew. Potential impacts to the first five species are addressed in the BE for the Park Falls Hardwoods project. Potential impacts to brook trout and Canada yew are addressed in the Management Indicator Species Report. Findings from both reports are summarized in Chapter 3 and Appendix C of this document as appropriate.

In addition to these seven MIS species, Appendix II of the Forest Plan (page II-1) identifies four **Management Indicator Habitats (MIH)** that will be monitored (mature northern hardwood interior forest, natural red/white pine forest, pine barrens, and regenerating aspen). Of the four Management Indicator Habitats, one of these, natural red/white pine forest, exist within the planning area, but would not be affected by the proposed or alternative actions (Management Indicator Habitats report). One MIH, pine barrens, does not exist within the planning area, and therefore would not be affected (Management Indicator Habitats report). The remaining two MIH (regenerating aspen and mature northern hardwood interior forest) could be affected by the project and findings from the MIH Report and the Forest Vegetation Resource Report on these two MIH are summarized in Chapter 3. See Appendix C of this document for a summary of findings for other MIH.

National Historic Preservation Act (16 U.S.C. 470): This Act provides direction for Federal agencies to establish a program for preservation of historic properties. In compliance with this act, a review was conducted to determine if cultural resource surveys had been conducted within the project area, and if sites had been recorded. Forty cultural resource surveys have been conducted in the area defined as the Park Falls Hardwoods project area. These surveys were performed in response to requirements stipulated in the National Historic Preservation Act of 1966 (16 U.S.C. 470f), the specific compliance procedures outlined in 36 CFR 800, Protection of Historic Properties. A total of 36 sites have been documented. Public disclosure of these locations is prohibited by the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470hh) and public disclosure is further exempted from Freedom of Information Act (reference 5 U.S.C. 552 B (3), exemption 3). The results of these surveys were shared with the State Historic Preservation Office for concurrence. Potential impacts to sites eligible for the National Register of Historic Places (NRHP), as well as for those not yet evaluated, were considered in the Cultural Resource Report (project file). Based on the analysis, no sites determined NRHP eligible or sites not yet formally evaluated would be impacted. See Appendix C for further information.

Clean Water Act (as amended, 1977): The Federal Water Pollution Control Act of 1972, as amended, is commonly referred to as the Clean Water Act. This was enacted to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Section 319 for the 1977 amendments requires each state to develop and implement a program to control silviculture-related and other non-point sources of water pollution to the maximum extent practicable. Non-point sources of water pollution are controlled by the use of best management practices. Wisconsin developed Forestry Best Management Practices for Water Quality (BMPs) in 1995. These practices (as amended) would be required for this project to prevent non-point sources of water pollution from forest management activities.

Under Section 404, the U.S. Army Corps of Engineers has been given responsibility to regulate the discharge of dredged and fill material into waters of the United States, including wetlands (33 CFR 323.3).

Normal silvicultural activities, including harvesting for the production of forest products or upland soil and water conservation practices, are exempt from Section 404 permits (33 CFR 323.4). Construction and maintenance of forest roads for normal silviculture are also exempt provided BMPs are applied (33 CFR 323.4; Wisconsin's Forestry Best Management Practices for Water Quality). Forest Plan standards and guidelines meet, and in some cases exceed, BMPs. Potential impacts to water quality are addressed in the Water Resources Report and summarized in Chapter 3 and Appendix C of this document as appropriate.

Clean Air Act: The Clean Air Act requires the Environmental Protection Agency (EPA) to identify common air pollutants that could endanger public health and welfare as well as develop National Ambient Air Quality Standards (NAAQS) for each of these criteria pollutants. Six criteria pollutants have been identified. Particulate matter (PM10) is the primary pollutant that can be generated on National Forests through prescribed burning (Forest Plan FEIS, page 3-40). There are no projects that include prescribed burning in any alternative for the Park Falls Hardwoods project.

The 1977 amendments to the Clean Air Act contained provisions for a Prevention of Significant Deterioration (PSD) program to prevent deterioration of air quality in specific attainment areas. Federal land managers are responsible for ensuring that major new sources of air pollution will not adversely affect air quality related values of Class 1 attainment areas (Forest Plan FEIS, page 3-40). There are no Class 1 air quality areas on the Medford-Park Falls Ranger District (Forest Plan FEIS, page 3-40 and 3-41).

Wild and Scenic Rivers Act: There are no rivers designated or eligible for designation as wild, scenic, or recreational rivers within or adjacent to the Park Falls Hardwoods project area (Forest Plan page 3-49 and Forest Plan FEIS, Appendix E).

Wilderness Act: There are no wilderness areas or wilderness study areas within or adjacent to the Park Falls Hardwoods project area (Forest Plan FEIS Appendix C, and Forest Plan ROD, page 16).

Environmental Justice: Executive Order 12898 ordered federal agencies to identify and address the issue of environmental justice (i.e., adverse human health and environmental effects of agency programs that disproportionately impact minority and low income populations). Based on experience with similar projects on the Chequamegon-Nicolet National Forest, none of the alternatives would disproportionately affect minority or low-income individuals, Native American Indians, women, or civil rights. The implementation of this project is expected to provide job opportunities in local and regional communities. Statistics for low income and minority populations in Price and Oneida counties do not exceed requirements for additional environmental justice review (Environmental Justice Report for Park Falls Hardwoods and Appendix C of this document).

CHAPTER 2 – ALTERNATIVES

This chapter describes five alternatives that were analyzed in detail, four of which wholly or partially meet the Purpose and Need identified in Chapter 1 and a no action alternative. The action alternatives identify specific activities that would occur if selected. Refer to the alternative maps in Appendix G for a visual display of the projects that would take place under each of the action alternatives. Stand and road treatment tables and narratives in Appendices E and F provide detailed information about treatments by alternative. Also displayed in those appendices are definitions of the projects and types of treatments. The project design features and mitigation measures that apply to each activity by alternative are displayed in Appendix F.

This chapter also gives a brief description of alternatives considered but eliminated from detailed study and explains why they were not studied in detail.

Finally, this chapter presents the five alternatives considered in detail in comparative form, outlining the differences among them, and providing a clear basis for choice by the responsible official. This comparison is based on the proposed activities, objectives, and the environmental effects described in Chapter 3.

Alternatives Considered in Detail

Alternative 1 – No Action

Alternative 1 is the "no action" alternative. The National Environmental Policy Act (NEPA) requires agencies to study the No Action Alternative in detail, and to use it as a baseline for comparing the effects of the action alternatives (40 CFR 1502.15(d). In other words, the No Action Alternative was analyzed in detail to show the agency's tradeoffs between taking no action and carrying out proposed activities to meet the purpose and need. This alternative does not respond to the defined purpose and need for action as described in Chapter 1. Under this alternative, none of the activities described in the other action alternatives would occur. Current, ongoing management would continue in the project area, including road and trail maintenance, fire suppression, special use authorizations, and recreation facility maintenance. Some already planned and approved timber harvest activities (primarily salvage harvest of areas impacted by insect and disease such as spruce decline) would also continue. The results of taking no action compared to the other alternatives are displayed in the tables that follow, as well as in the individual resource analysis sections of Chapter 3.

Alternative 2

Based on internal and external scoping of the proposal (Alternative 5), the amount of woodland hawk nesting habitat that might be potentially impacted was a concern, specifically the species northern goshawk and red-shouldered hawk (Regional Forester Sensitive Species – RFSS). Based on the initial scoping of the proposal, an alternative was developed to specifically reduce the amount of potential nesting habitat (for these two species) that might be impacted. Based on best available science, the Forest uses specific criteria for determining what comprises nesting habitat for these 2 hawk species. Those criteria include forest type, age, and canopy closure. This alternative was designed to maintain 80% canopy closure in forest types and ages that are considered habitat (primarily northern hardwoods 50 years and older, and aspen types 50-65 years old.). As a result, the following treatments were excluded in this alternative: clearcuts and improvement cuts in 50-65 year old aspen, improvement cuts in 50 year old plus lowland hardwoods, and selection harvest in northern hardwoods that would reduce canopy closure below 80%.

This alternative also included less road construction than the proposal. In addition to the above criteria used for limiting impacts to woodland hawk habitat, isolated harvest areas were dropped from this alternative if they would have required lengthy amounts of road construction to reach.

A summary of the projects in this alternative include:

Table 4: Alternative 2 Treatment/Activity Summary and Harvest Volume Summary			
Vegetation Treatments.		**Other Miscellaneous Projects**	
Harvest Treatments (Acres)			
Clearcut	260	Spruce Grouse Habitat Improvement (Acres)	0
Overstory Removal	160	Browse Protected Sites or Supplemental Planting and Fencing (Canada Yew).	5
Shelterwood	377		
Improvement	1,073	Riparian Coldwater Stream Improvement (Acres).	216
Thinning	145		
Selection	6,707	Miles of Designated Walking Trail.	
Harvest Total	8,722	-Fould's Creek -Elk River	0.8 4.9
Biomass Harvest	Up to 854	**Road Projects (Miles)**	
		Permanent Construction	6.3
Supplemental Tree Planting (Acres)	167	Temporary Construction	1.0
Mechanical Site Preparation (Acres)	309	Road Reconstruction/Maintenance	10.9
		Road Reconstruction (Winter)	18.2
		Decommission	28.9
Forest Products			
Sawtimber (MMbf *)	7	Biomass (green tons):	0-3,859
Pulpwood (MMbf)	36		

*MMbf = 1 million board feet

Refer to Appendices E and F for additional detail regarding individual stand treatments, project design features, and applicable Forest Plan standards and guidelines that are a part of this alternative.

In this alternative and other action alternatives except for Alternative 5 (the proposed action), biomass harvest is only allowed in non-hardwood stands. At the time of the development of the proposed action, the CNNF was participating and providing review in development of state biomass harvesting guidelines. Subsequent to the proposed action development, the state biomass harvesting guidelines were finalized and the CNNF reviewed our Forest Plan to determine if Forest Plan standards and guidelines were in alignment with the state guidelines. A CNNF letter dated May 21, 2010 provided some direction for the CNNF and biomass proposals. *"In March 2009, the Wisconsin Council on Forestry approved the Wisconsin Forestland Woody Biomass Harvesting Guidelines (BHGs). The Chequamegon-Nicolet National Forest (CNNF) participated in the development of these guidelines and will continue to participate in the monitoring and refinement of these BHGs. It is my expectation we will include these guidelines, where appropriate, in our vegetation management project proposals. In addition, I expect that the CNNF will incorporate these BHGs in timber sale contracts where biomass removal may occur to the extent that it is compatible with the 2004 Forest Plan."* Further guidance for MA 2B within the May 21, 2010 memo was: "*Avoid biomass harvesting in hardwood stands within Management Area 2B when retaining fine woody debris would contribute to other resource objectives. This is not a prohibition on biomass harvesting in northern hardwoods stands in MA 2B. However, if biomass harvesting is considered in hardwood stands, I expect rationale to be disclosed on the anticipated benefit."* Since biomass harvest in northern hardwood stands is being considered in the proposed action (Alternative 5), biomass harvest in other action alternatives has been limited to non-hardwood types so that any impacts to or tradeoffs on resources can be considered in the decision.

This alternative is less aggressive than the proposed action (Alternative 5) at treating overstocked stands, but otherwise meets the purpose and need for the project to some extent, and moves the project area

towards the desired vegetation conditions. More details on how this and other alternatives respond to specific needs and objectives for this project can be found in the alternative comparison at the end of this chapter.

Alternative 3

One comment letter on the proposed action identified specific criteria for an alternative that they felt would meet their issues and concerns with the proposed action. Based on the suggested criteria, an alternative was developed in detail. The six suggested criteria for alternative development were as follows:

- Defer all proposed selection logging and biomass harvest in hardwood stands over 80 years of age, to promote continued progress toward "old growth" habitat conditions, including high levels of downed woody debris.
- Limit preemptive Emerald Ash Borer treatment to an experimental area sufficient for monitoring the effectiveness of this strategy before it is broadly applied.
- Eliminate all proposed aspen clearcuts and regeneration within 30 meters of Canada Yew sites to reduce amounts of new forage for white-tailed deer.
- Defer all logging within 124 acres of historic or current goshawk or Red-shouldered hawk nest sites.
- Eliminate proposed logging within 30 meters of any stream, lake, or other water body in the Project area, except to facilitate succession to longer-lived species.
- Close and decommission additional roads in the project area, and reduce the amount of proposed road construction, particularly in Riparian Management Zones.

A summary of the projects in this alternative include:

Table 5: Alternative 3 Treatment/Activity Summary and Harvest Volume Summary

Vegetation Treatments.		**Other Miscellaneous Projects**	
Harvest Treatments (Acres)			
Clearcut	445	Spruce Grouse Habitat Improvement (Acres)	24
Overstory Removal	158	Browse Protected Sites or Supplemental Planting and Fencing (Canada Yew).	2
Shelterwood	304		
Improvement	1,277	Riparian Coldwater Stream Improvement (Acres).	183
Thinning	126		
Selection	6,659	Miles of Designated Walking Trail.	
Harvest Total	8,969	-Fould's Creek -Elk River	0.8 4.9
Biomass Harvest	Up to 1,045	**Road Projects (Miles)**	
		Permanent Construction	7.1
Supplemental Tree Planting (Acres)	224	Temporary Construction	1.4
Mechanical Site Preparation (Acres)	304	Road Reconstruction/Maintenance	14.4
		Road Reconstruction (Winter)	17.7
		Decommission	30.9
Forest Products			
Sawtimber (MMbf)	7	Biomass (green tons):	0-5,964
Pulpwood (MMbf)	38		

All selection harvest in hardwood stands over 80 years of age was excluded in this alternative. Vegetation treatments within 124 acres of historic or current northern goshawk nests were also excluded

in this alternative. As a result, there was a decrease in the amount of road construction needed. Also, as a result of not harvesting in hardwood stands over 80 years of age, there is less treatment to reduce the ash component in anticipation of a potential emerald ash borer infestation. There were no aspen regeneration cuts proposed within 30 meters of Canada yew and there are no historic or current red-shouldered hawk nests in the project area, therefore these 2 criteria were not used specifically for development of this alternative. Based on state and Forest Plan guidelines for protection of water and riparian habitat, the proposal and all other alternatives would be very similar in the above request to limit the type of harvest near water. This alternative also included some additional road decommissioning and less road construction. Isolated harvest areas were dropped from this alternative if they would have required lengthy amounts of road construction to reach.

Refer to Appendices E and F for additional detail regarding individual stand treatments, project design features, and applicable Forest Plan standards and guidelines that are a part of this alternative.

In this alternative and other action alternatives except for Alternative 5 (the proposed action), biomass harvest is only allowed in non-hardwood stands and all biomass harvest will be consistent with Wisconsin Forestland Woody Biomass Harvesting Guidelines (BHGs). This alternative is less aggressive than the proposed action (Alternative 5) at treating overstocked stands, but otherwise meets the purpose and need for the project to some extent, and moves the project area towards the desired vegetation conditions. More details on how this and other alternatives respond to specific needs and objectives for this project can be found in the alternative comparison at the end of this chapter.

Alternative 4

Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). Another concern about the proposal was the overall amount of treatment of northern hardwood stands to move them towards an uneven aged condition, and the potential impacts that might occur as a result. While the Forest Plan management prescription (2B) for the Park Falls Hardwoods project area is to clearly limit the amount of early successional forest, and while the existing condition of the project area is already above that limit (25% aspen with desired amount 10% or less), there is some flexibility in the amount of aspen that could be converted to late successional species in any particular alternative. The proposal (Alternative 5) is fairly aggressive in moving towards Forest Plan goals and objectives for MA 2B, particularly in aspen reduction and moving northern hardwood stands towards an uneven-aged condition. Natural forest successional processes will lead to a decline in aspen and movement of the existing areas of hardwoods to an uneven-aged condition over time even if no treatments are proposed; however, the treatments were intended to hasten these processes. This alternative (Alternative 4) is one that takes more time to reach the intended vegetation condition of the MA 2B area than the proposed action (Alternative 5), but is still moving the area towards the vegetation objectives as outlined in the MA 2B management prescription, while being responsive to key vegetation features of the area such as maintaining large blocks of healthy, mature, continuous canopy forest.

Alternative 4 has more aspen clearcutting, less improvement harvest, and less hardwood selection harvest than the proposed action (Alternative 5). Even though this alternative has more aspen clearcutting than other alternatives, the amount of aspen regeneration (clearcutting) does not exceed 20 percent of the maximum desired amount of aspen in MA 2B. In other words, in MA 2B the desired amount of aspen is between 0 and 10% of the upland forest. If we were going to maintain aspen at the Forest Plan upper limit of 10% of the upland forest, that would translate to about 2400 acres. Then, in order to retain that amount of aspen over time, regeneration of about 20% of it every 10 years would be desirable. This translates to about 480 acres of aspen regeneration as a maximum desired amount. Alternative 4 regenerates 466 acres of aspen to address the concerns pertaining to early successional wildlife and the decline of aspen habitat.

Refer to Appendices E and F for additional detail regarding individual stand treatments, project design features, and applicable Forest Plan standards and guidelines that are a part of this alternative.

In this alternative and other action alternatives except for Alternative 5 (the proposed action), biomass harvest is only allowed in non-hardwood stands and all biomass harvest will be consistent with Wisconsin

Forestland Woody Biomass Harvesting Guidelines (BHGs). This alternative is less aggressive than the proposed action (Alternative 5) at treating overstocked stands, but otherwise meets the purpose and need for the project to some extent, and moves the project area towards the desired vegetation conditions. More details on how this and other alternatives respond to specific needs and objectives for this project can be found in the alternative comparison at the end of this chapter.

A summary of the projects in this alternative include:

Table 6: Alternative 4 Treatment/Activity Summary and Harvest Volume Summary			
Vegetation Treatments.		**Other Miscellaneous Projects**	
Harvest Treatments (Acres)			
Clearcut	578	Spruce Grouse Habitat Improvement (Acres)	52
Overstory Removal	160	Browse Protected Sites or Supplemental Planting and Fencing (Canada Yew).	3
Shelterwood	377		
Improvement	1,035	Riparian Coldwater Stream Improvement (Acres).	231
Thinning	145		
Selection	12,071	Miles of Designated Walking Trail.	
Harvest Total	14,366	-Fould's Creek -Elk River	0.8 4.9
Biomass Harvest	Up to 1,217	**Road Projects (Miles)**	
		Permanent Construction	11.4
Supplemental Tree Planting (Acres)	264	Temporary Construction	1.4
Mechanical Site Preparation (Acres)	309	Road Reconstruction/Maintenance	16.8
		Road Reconstruction (Winter)	22.7
		Decommission	28.9
Forest Products			
Sawtimber (MMbf)	12	Biomass (green tons):	0-7,545
Pulpwood (MMbf)	61		

Alternative 5 – Proposed Action

Alternative 5 is the proposed action, designed to meet as much of the purpose and need as possible (Chapter 1), while still meeting Forest Plan standards and guidelines. Refer to Appendices E and F for additional detail regarding individual stand treatments, project design features, and applicable Forest Plan standards and guidelines that are a part of this alternative.

This alternative was designed to aggressively address forest health issues such as overstocking of trees, emerald ash borer susceptibility, and even-aged conditions in northern hardwood stands. This alternative also addresses the need for meeting the general landscape patterns as outlined in the Forest Plan MA 2B prescription for large, continuous blocks of mature hardwood forest.

While not required, biomass harvest would be allowed upon request in most harvest treatments, including northern hardwood types, to meet estimated demand and encourage utilization of wood products as an alternative to the use of fossil fuels. All biomass harvest will be consistent with Wisconsin Forestland Woody Biomass Harvesting Guidelines (BHGs). More details on how this and other alternatives respond to specific needs and objectives for this project can be found in the alternative comparison at the end of this chapter.

A summary of the projects in this alternative include:

Table 7: Alternative 5 Treatment/Activity Summary and Harvest Volume Summary			
Vegetation Treatments.		**Other Miscellaneous Projects**	
Harvest Treatments (Acres)			
Clearcut	449	Spruce Grouse Habitat Improvement (Acres)	60
Overstory Removal	160	Browse Protected Sites or Supplemental Planting and Fencing (Canada Yew).	6
Shelterwood	377		
Improvement	1,387	Riparian Coldwater Stream Improvement (Acres).	294
Thinning	146		
Selection	14,505	Miles of Designated Walking Trail.	
Harvest Total	17,024	-Fould's Creek -Elk River	0.8 4.9
Biomass Harvest	Up to 16,984	**Road Projects (Miles)**	
		Permanent Construction	11.9
Supplemental Tree Planting (Acres)	264	Temporary Construction	1.4
Mechanical Site Preparation (Acres)	309	Road Reconstruction/Maintenance	17.0
		Road Reconstruction (Winter)	26.2
		Decommission	30.9
Forest Products			
Sawtimber (MMbf)	14	Biomass (green tons):	0-30,400
Pulpwood (MMbf)	71		

Design Features Common to All Action Alternatives

The 2004 Forest Plan identifies standards and guidelines to be implemented with forest management activities. The Forest Plan standards and guidelines that apply to the action alternatives are shown in Table E5, Appendix E. Also in Table E5 are additional design measures that may be more specific than the Forest Plan standards and guidelines and that were determined to be needed for projects being considered in this analysis. Both Forest Plan standards and guidelines and the additional design measures are an integral part of each of the action alternatives. These measures reduce or prevent environmental impacts. Impacts of the alternatives described in Chapter 3 presume that these measures are implemented along with the project activity.

Alternatives Considered but Eliminated From Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14). Five other alternatives were considered. A brief description of the alternative considered and reasons for elimination from detailed analysis are included in this section.

Dual designation of town or joint jurisdiction roads for HLV and OHV: Several respondents on the proposal requested to have roads such as FR 130, 131, and 503 opened to OHV use. Jurisdiction for FR 131, 132, 136, and 503 for the requested type of use (off highway vehicles) resides with the Town of Emery and not the Forest Service. These roads are currently closed to recreational wheeled vehicles such as ATVs. This requested use could be included as an alternative for road system use; however, such an alternative would be outside Forest Service jurisdiction to implement.

Introduce elk into the project area: Comments received on the proposal included a request to consider elk re-introduction into the area. Any elk re-introduction would be under the jurisdiction of the Wisconsin Department of Natural Resources and they have not proposed re-introduction into the Park Falls Hardwoods project area. Any consideration of re-introduction of elk would also include an assessment of elk habitat needs such as large upland openings which do not occur within this project area, nor are their creation compatible with the Forest Plan management direction for this area. This requested use could be included as an alternative; however, such an alternative would be outside Forest Service jurisdiction to implement.

Request to add to the OHV designated trail system: The Park Falls Hardwoods project area does not lend itself to motorized trail construction due to soil type, slope, and wetlands found within the area. Much of the project area has also been designated as a non-motorized area which precludes any new motorized trail construction without a Forest Plan revision. Areas adjacent to the project area that do lend themselves to ecologically sound trail construction have been taken advantage of with the designation of the Flambeau ATV trail system. This 70 mile trail system allows for ATV and motorcycle use and is west and north of the project area on the Park Falls landbase.

Increase the amount of early successional habitat (primarily aspen) in the project area: Comments on the proposal included a request to increase the amount of aspen for early successional wildlife within the project area. This request was based on a concern that aspen and associated species were already decreasing on a forest wide basis. This alternative was not developed in detail because it would be contrary to the objectives for the 2B management area per the Forest Plan, which is to maintain a landscape of primarily mature northern hardwoods. On the Park Falls land base of the CNNF, there is already a high percentage in management areas designated for aspen management and retention in the Forest Plan (MA 1A). The pattern of loss of aspen across the CNNF landscape does not necessarily correspond to what is happening in the more local landscape of Price County. While an alternative that maintained or increased the existing percentage of aspen was not analyzed in detail, Alternative 4 was developed to address this concern by having less aspen conversion to northern hardwood types than the proposal included.

Maintain early successional habitat to prevent conversion to hardwoods with an ash component to decrease susceptibility to an EAB infestation: Comments on the proposal included a suggestion to manage susceptibility to EAB by maintaining early successional species such as aspen. Many stands proposed for conversion from aspen with an improvement cut treatment currently have a variety of northern hardwood species already established in the stand as seedlings, saplings and trees, including ash species. It is not expected that ash will replace aspen in these stands. As long as ash is a minor component within the area, rapid spread of EAB would not be expected. Aspen improvement cuts, which are designed to decrease early successional forest types, also include direction to reduce the amount of ash within the stand, particularly in those areas where there are groupings of ash. Each alternative developed in detail already includes varying amounts of treatments to reduce the ash component to determine if there are any major differences in alternatives pertaining to projected EAB impacts.

Identification of the Preferred Alternative

The Forest Service preferred alternative is Alternative 5.

Alternative Comparison

This section compares some of the effects of the alternatives in a summary form. Table 8a compares the activities, treatments and products by alternative. Table 8b gives a more detailed comparison of the harvest activities by what forest types would be maintained (early, mid, or late successional forest types). Table 8c compares how well each alternative meets the purpose and need based on the project objectives described in Chapter 1 and also compares how each alternative would impact each of the resources identified in the Issues / Objectives section of Chapter 1. Information in the tables is focused on activities and effects where differences can be distinguished quantitatively. Qualitative differences between alternatives are summarized following Table 8c and a more detailed discussion of effects is provided in Chapter 3 – Affected Environment and Environmental Consequences.

Table 8a: Treatment/Activity/Volume Summary by Alternative					
Treatment	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Harvest Treatments (acres)					
Clearcut	0	260	445	578	449
Overstory Removal	0	160	158	160	160
Shelterwood	0	377	304	377	377
Improvement	0	1,073	1,277	1,035	1,387
Thinning	0	145	126	145	146
Selection	0	6,707	6,659	12,071	14,505
TOTAL (acres):	**0**	**8,722**	**8,969**	**14,366**	**17,024**
Biomass Harvest (acres)	0	0 - 854	0 - 1,045	0 - 1,217	0 - 16,984
Road and Trail Treatments (miles)					
Designated Walking Trails	0	5.7	5.7	5.7	5.7
Permanent Road Construction	0	6.3	7.1	11.4	11.9
Temporary Road Construction	0	1.0	1.4	1.4	1.4
Road Reconstruction / Maintenance	0	10.9	14.4	16.8	17.0
Road Reconstruction (winter)	0	18.2	17.7	22.7	26.2
Road Decommissioning	0	28.9	30.9	28.9	30.9
Other Treatments (acres / sites)					
Supplemental Tree Planting (acres)	0	167	224	264	264
Mechanical Site Preparation (acres)	0	309	304	309	309
Spruce Grouse Habitat Improvement (acres)	0	0	24	52	60
Canada Yew Improvement (sites)	0	5	2	3	6
Coldwater Stream Maintenance / Improvement (acres)	0	216	183	231	294
Forest Products (MMbf* / green tons)					
Sawtimber (MMbf)	0	6	6	11	14
Pulpwood (MMbf)	0	37	39	62	71
TOTAL (MMbf)	**0**	**43**	**45**	**73**	**85**
Biomass (green tons)	0	0 - 3,859	0 - 5,964	0 - 7,545	0 - 30,400
MMbf = million board feet					

Table 8b: Harvest Treatments by Forest Type and Alternative					
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Clearcut, Aspen (Objective 9)	0	180	369	498	369
Salvage Clearcut Blowdown (Objective 3)	0	18	18	18	18
Shelterwood Seed Cut for Paper Birch (Objective 5)	0	154	149	154	154
Subtotal (maintain early successional species)	**0**	**352**	**536**	**670**	**541**
Improvement Cut, convert to Mixed Hardwoods (Objectives 2, 6, and 8)	0	952	1064	752	1105
Improvement Cut, convert to Long-lived Conifer (Objectives 2, 6, and 8)	0	82	127	127	127
Overstory Removal Cut, convert to Long-lived Conifer (Objectives 5 and 6)	0	160	158	160	160
Shelterwood Removal Cut, convert to Long-lived Conifer (Objectives 5 and 6)	0	97	97	98	97
Subtotal (increase late successional species)	**0**	**1291**	**1446**	**1137**	**1489**
Improvement Cut Lowland Hardwood Diversity (Objective 2)	0	0	49	117	117
Individual Tree Selection Northern Hardwood (Objectives 1, 2, 5, 7, and 8.)	0	6707	6659	12071	14505
Shelterwood Preparation Cut Oak (Objective 5)	0	126	58	126	126
Commercial Thin Red Pine (Objective 5)	0	64	64	64	64
Commercial Thin White Spruce (Objective 5)	0	82	62	82	82
Improvement Cut Conifer /Spruce (Objective 5)	0	38	38	38	38
Salvage Clearcut White Spruce (Objective 3)	0	62	58	62	62
Subtotal (maintain mid to late successional species)	**0**	**7079**	**6987**	**12559**	**14994**
Vegetation Treatment Total	**0**	**8722**	**8969**	**14366**	**17024**

Table 8c: Alternative Impact Comparison Table					
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
TREATMENT TO SLOW EMERALD ASH BORER SPREAD (OBJECTIVE 2)					
Acres Treated to Reduce Ash Density	0	6707	6708	12207	14622
% of Total Amount of Acres with Ash Component (18,439 acres)	0	36	36	66	79
RESTORE WIND AND DISEASE DAMAGED FOREST TO A PRODUCTIVE FORESTED CONDITION (OBJECTIVE 3)					
Acres of Wind and Disease Damaged Areas Treated	0	80	76	80	80
% of Total Amount of Damaged Acres Treated (80 acres)	0	100	95	100	100
REDUCE STOCKING LEVELS IN OVERSTOCKED FORESTED AREAS (OBJECTIVE 5)					
Acres of Overstocked Areas Treated	0	7013	6943	12377	14811
% of Total Amount of Overstocked Acres Treated (about 17,000 acres)	0	41	41	73	87
REDUCE THE AMOUNT OF EARLY SUCCESSIONAL FOREST (PRIMARILY ASPEN) (OBJECTIVE 6)					
Acres of Aspen Treated for Conversion to Mid/Late Successional Forest	0	835	985	730	1011
Total Acres of Aspen Conversion (includes natural succession)	466	841	1017	796	1017
% Reduction of Aspen (15 years following treatment)	2	3	4	3	4
% of Aspen in MA 2B Upland (desired is 0-10%)	23	22	21	22	21
MAINTAIN OR IMPROVE ASPEN AGE CLASS DISTRIBUTION (OBJECTIVE 9)					
Total Acres of Aspen Regeneration (out of 6049 acres currently in aspen)	0	180	369	466	369
% of Aspen 0-10 Years Old (Existing %=11, Desired %=20)	4	8	12	13	12
DEVELOP UNEVEN AGE STRUCTURE WITHIN NORTHERN HARDWOOD TYPES (OBJECTIVE 7)					
Acres of Northern Hardwoods Treated to Develop Age Structure	0	6707	6659	12071	14505
% of Total Even-aged Hardwoods Treated (16,510 acres)	0	41	40	73	88
INCREASE NORTHERN HARDWOOD PATCH SIZE AND CONTINUOUS CANOPY CONDITIONS (OBJECTIVE 8)					
Acres of Mid to Late Successional Forest	17605	18436	18617	18255	18606
% Increase of Mid to Late Successional Forest (15 years following treatment)	3	6	6	5	6
% of MA 2B in Mid to Late Successional Forest	74	77	77	76	77
NORTHERN BUR-REED (ISSUE 1)					
Suitable Habitat Available (as a percentage of total habitat in project area)	100	>99	>99	>99	>99
STOLONIFEROUS SEDGE (ISSUE 1)					
Suitable Habitat Available (as a percentage of total habitat in project area)	100	>99	>99	>99	>99
AMERICAN GINSENG (ISSUE 1)					
Suitable Habitat Available (as a percentage of total habitat in project area)	100	>99	>99	>99	>99
RESTORE CANADA YEW WITHIN NORTHERN HARDWOODS ECOSYSTEMS IN MA 2B (OBJECTIVE 4, ISSUE 1)					
# Stands with Canada Yew Treated for Enhancement of Existing Populations	0	5	2	3	6
% of Total Yew Occupied Stands Treated for Enhancement (11 stands)	0	45	18	27	55
NORTHERN GOSHAWK (ISSUE 2)					
Acres of Nesting Habitat on Medford Park Falls District (Currently)	96,810	96,810	96,810	96,810	96,810
Nesting Habitat on Medford Park Falls District (Immediately following treatment)	96,031 -779 ac -0.8%	96,012 -798 ac -0.8%	91,892 -4,918 ac -5.1%	89,220 -7,590 ac -7.8%	88,202 -8,608 ac -8.9%

Table 8c: Alternative Impact Comparison Table					
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Northern Goshawk Nesting Habitat on Medford Park Falls District (Five years after treatment)	97,034 +224 ac +0.2%	97,015 +205 ac +0.2%	96,763 -47 ac -0.05%	96,773 -37 ac -0.04%	96,763 -47 ac -0.05%
RED-SHOULDERED HAWK (ISSUE 2)					
Acres of Nesting Habitat on Medford Park Falls District (Currently)	95,941	95,941	95,941	95,941	95,941
Nesting Habitat on Medford Park Falls District (Immediately following treatment)	96,114 +203 ac +0.2%	96,103 +162 ac +0.2%	92,322 -3,619 ac -3.8%	89,661 -6,280 ac -6.5%	88,624 -7,317 ac -7.6%
Nesting Habitat on Medford Park Falls District (Five years after treatment)	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%
LITTLE BROWN MYOTIS, NORTHERN LONG-EARED MYOTIS, AND TRI-COLORED BAT (ISSUE 2)					
Foraging Habitat Available in the Project Area (acres)	19,714	19,714	19,714	19,714	19,714
Roosting Habitat Available in the Project Area (acres)	16,769	16,769	16,769	16,769	16,769
Foraging and Roosting Habitat That Would Have Short Term Impacts (acres)	0	126	58	126	126
Foraging and Roosting Habitat Maintained (percent)	100	>99	>99	>99	>99
SPRUCE GROUSE (OBJECTIVE 10, ISSUE 2)					
Habitat Improvement (acres)	0	0	24	52	60
Short Term Habitat Loss (acres)	0	30	63	71	71
Long Term Habitat Loss (acres)	0	18	18	18	18
BROOK TROUT (OBJECTIVE 11, ISSUE 2, ISSUE 6)					
Total Timber Harvest Treatments in Trout System Buffers - Acres (%)	0	216 (10%)	183 (8%)	231 (10%)	294 (13%)
EARLY SUCCESSIONAL WILDLIFE (ISSUE 3)					
0-10 Year Old Aspen (5 years following harvest) – Acres	239	436	626	705	626
GENERAL WILDLIFE – COARSE AND FINE WOODY DEBRIS (ISSUE 4)					
Harvest Generated Biomass/Fine Woody Debris (dry tons)	NA	48,819	50,455	80,155	94,160
Pre-harvest Naturally Occurring FWD on Forest Floor (dry tons) – Existing FWD Condition	NA	26,166	26,907	43,098	51,072
Allowed Biomass Harvest (dry tons)*	NA	3,382	4,507	5,394	19,568
Total Biomass (FWD) Remaining in All Harvested Stands (Total Generated + Existing - Removed) (dry tons)	NA	71,603	72,855	117,859	125,664
Average Biomass (FWD) Remaining in Harvested Stands (Total Remaining / Harvest Treatment Acres) (dry tons / acre)	NA	8.2	8.1	8.2	7.4
% Change From Existing Condition	NA	+174	+171	+173	+146
SOILS (ISSUE 5)					
Direct / indirect long-term detrimental disturbance (predicted) – Acres (%)	0	97 (1)	100 (1)	154 (1)	182 (1)
Past detrimental disturbance – Acres (%)	102 (<1)	52 (<1)	54 (<1)	86 (<1)	102 (<1)
Cumulative detrimental disturbance – Acres (%)	102 (<1)	149 (2)	154 (2)	240 (2)	284 (2)
Long-term productive soil resource– Acres (%)	16922 (>99)	8573 (98)	8815 (98)	14126 (98)	16740 (98)
AQUATIC RESOURCES (ISSUE 6)					
Acres of Tree Bole Harvest in Water Body RMZ (out of 867 acres)	0	68	68	65	86
Biomass Harvest in RMZ (out of 867 acres)	0	18	18	18	81
Road Construction (feet) in RMZ	0	0	0	0	0
Road Reconstruction (feet) in RMZ	0	121	121	121	121

Table 8c: Alternative Impact Comparison Table					
	Alt 1	**Alt 2**	**Alt 3**	**Alt 4**	**Alt 5**
Road Decommissioning (feet) in RMZ	0	591	591	591	591
TRANSPORTATION (OBJECTIVE 14, ISSUE 7)					
Project Area Total Road Density – miles per square mile	3.2	2.8	2.7	2.8	2.8
Project Area Open Road Density – miles per square mile	1.0	1.3	1.3	1.3	1.3
DEMAND FOR WOOD PRODUCTS (OBJECTIVE 13, ISSUE 8)					
Harvest Volume (MMbf)	0	43.6	45.5	73.2	84.9
Biomass Volume (up to X green tons)	0	3,859	5,964	7,545	30,400
$ Available to Counties (sawtimber and pulpwood) (to nearest thousand)	0	475	491	798	929
$ Available to Counties from Biomass (up to X $) (to nearest thousand)	0	1	2	3	11
WALKING TRAILS (OBJECTIVE 12, ISSUE 7)					
Fould's Creek Trail (Miles)	0	0.8	0.8	0.8	0.8
Elk River Walking Trial (Miles)	0	4.9	4.9	4.9	4.9
HARVEST IMPACTS ON ATMOSPHERIC FLUX OF CARBON DIOXIDE (OBJECTIVE 1)					
Potential for Research on Impacts of Selection Harvest	No	No	No	Yes	Yes

Resource impact comparisons below (and in Table 8c) are ordered the same as in Chapter 3.

Forest Vegetation

Ash composition and forest resiliency to emerald ash borer (EAB) – Objective 2: Both spatially and with the amount of treated acres (79% of acres with an ash component would be treated), Alternative 5 has the least risk for spread of EAB (Table 8c and Alternative 5 EAB Risk Map, Appendix G). Spatially (with the juxtaposition of treated areas to untreated areas), the treated areas are located throughout the entire analysis area and provide isolation of "unprotected areas" such as 8E, 8F, 8G and 6B MAs. As a comparison, the action alternative which appears to leave more unprotected ash on the landscape is Alternative 3. Although Alternatives 2 and 3 treat similar acreages, spatially, the configuration of untreated stands in Alternative 3 appears to show more EAB risk potential because of the connectivity of the untreated stands. Alternative 1, the No Action Alternative, does not meet the need for increasing resiliency to an EAB infestation. In Alternative 1, EAB, once established would be expected to move quickly throughout the project area and widespread mortality could be expected within five years.

Wind and disease damaged forest – Objective 3: All action alternatives (2-5) are similar in restoration of wind and disease damaged forest (95-100% of the identified 80 acres with damage). See Table 8c.

Forest tree stocking levels – Objective 5: Selection harvesting, commercial thinning and overstory removal treatments in overstocked stands will improve the health and vigor of the forest. Competition for resources would continue to contribute to less resilience from stressors such as drought, disease, and insect infestation on untreated / overstocked acres. Alternatives 4 and 5 meet this need by treating most of the acres that are in an overstocked state (73-87% of areas identified as overstocked, or about 12,000 to 15,000 acres). These alternatives would provide some resiliency to future stressors and would potentially reduce tree mortality. Alternatives 2 and 3 meet this need on less than half of the overstocked acres, and Alternative 1 does not meet this need, leaving 100% of the upland forested vegetation at a higher risk or susceptibility to stressors.

Forest composition (amount of aspen types) - Objective 6: All alternatives move the project area closer to the desired amount of aspen (either by natural succession or by specific harvest treatments favoring regeneration of later successional types). Within a 15 year period, the projected percentage reduction of aspen in the MA 2B is 2 to 4% of the upland forest acres, depending on the alternative. Alternatives 3 and 5 reduce the amount of aspen by an amount that is about double of what natural succession would accomplish. Also, it should be noted that the aspen specifically treated for conversion

in each alternative already has a vegetation component that makes conversion likely within 15 years. Any natural succession conversions of aspen would just be starting in 15 years. For this reason, the action alternatives are more likely to reach the desired condition (conversion to later successional forest types) within the noted 15 year time frame.

Aspen age class - Objective 9: While there is an overabundance of early successional species in the project area, the early successional species that are present are over represented in the older age groups, with limited representation in the youngest age groups (0-10 years of age). Currently there is about 11% of the aspen in the youngest age class and the desired amount of aspen in this age class would be about 20%. In managing early successional species, an even distribution across age groups is called for in the Forest Plan. Alternatives 3, 4 and 5 all move closer to the Forest Plan's desired condition for aspen age class distribution about equally though Alternative 4 creates 1% more young aspen than Alternatives 3 and 5 as should be expected given the emphasis on early successional habitat in Alternative 4. In Alternatives 1 and 2 the youngest age class of aspen moves further from the Forest Plan desired condition which is the result of aspen that ages into the 11-20 year age class and the limited amount of aspen being recruited into the 0-10 year age class.

Northern hardwood forest age structure - Objective 7: Selection harvesting is a method of harvest that results in formation of trees of a variety of ages within an area. As noted earlier, the northern hardwoods in MA 2B are comprised mostly of trees the same age. Maintaining or promoting trees of different ages within MA 2B is the desired condition to promote and maintain a variety of flora and fauna. All the action alternatives address the project need to develop uneven-aged northern hardwoods. Alternative 5 treats about 88% of the northern hardwoods that are in an even-aged condition. See Table 8c. Most of the remaining hardwood stands that are untreated in Alternative 5 are too young or the stocking level is too low to implement a selection harvest. Alternative 4 treats about 73% of the northern hardwoods. Alternatives 2 and 3 treat about 40% of the northern hardwoods. Alternative 1 does not meet the need for moving northern hardwood stands from an even to an uneven-aged condition. It should be noted that even-aged hardwood stands could develop some uneven-aged structure on their own. As individual trees are lost through mortality, other trees will regenerate. The difference between treatment and non-treatment is the time it may take to develop an uneven-aged condition. On the treated acres, uneven-aged conditions would be reached in about 45 years. On the untreated acres of northern hardwood, it is estimated the timeline to reach uneven-aged hardwood conditions is greater than 100 years.

Northern hardwood patch size and continuous canopy conditions - Objective 8: All alternatives move the project area closer to the desired condition of continuous canopy and large blocks of northern hardwood forest. Alternatives 2, 3, and 5 respond to this need with a 6% increase in later successional species. Alternative 4, responds with a 5% increase and Alternative 1 (No Action) with a 3% increase. As noted previously, the stands identified for conversion treatments already have a vegetation component that makes conversion to later successional forest likely within 15 years. The existing hardwood patch size would only be slightly increased in any alternative due to the already large blocks of northern hardwood forest in the project area.

Rare Plants

Regional Forester Sensitive Species (RFSS) – Northern bur-reed, stoloniferous sedge and American ginseng - Issue 1: Because of their known occurrence and abundant suitable habitat in the project area, stoloniferous sedge and American ginseng are Regional Forester Sensitive Species (RFSS) that had the potential to be impacted by the proposal and alternatives. For stoloniferous sedge, 19 acres, or less than 1/10 of a percent of suitable (unoccupied) habitat would become unsuitable habitat in all the action alternatives (Alternatives 2-5). Impacts to individual plants or plant colonies are not expected in any alternative. More than 99% of the currently suitable habitat in the project area would remain suitable for stoloniferous sedge.

Northern bur-reed has two known occurrences within the project area. Both stands surrounding these sites would be harvested in Alternatives 2, 4, and 5, while Alternative 3 would harvest near one site. There are no expected impacts to the known occurrences as the plant locations would be buffered to prevent disturbance from equipment. While habitat availability or abundance for this species is wide-

spread throughout the project area, protection of this habitat occurs from implementation of design measures such as winter only logging which help maintain habitat as suited.

For American ginseng, 19 acres, or about 1/10 of a percent of suitable (unoccupied) habitat would become unsuitable habitat in all the action alternatives (Alternatives 2-5). Impacts to individual plants or plant colonies are not expected in any alternative. About 99% of the currently suitable habitat in the project area would remain suitable for American ginseng.

Other Plants

Management Indicator Species (MIS) Canada yew - Objective 4: There are 11 documented sites of Canada yew within the project area totaling about 25-30 individual plants. All of the plants documented within the project area are of small stature, appear heavily browsed, and show no signs of reproduction (flowers, fruits, etc). Alternatives 1, 2, 3, 4, and 5 would have no negative direct or indirect effect. Planting and subsequent fencing of planted yew would be a direct positive effect in Alternatives 4 and 5. Cumulatively, recent past management has had little or no effect on Canada yew in the project area. When combined with this project, any cumulative effect would be positive, primarily because yew numbers would increase through planting and fencing in Alternatives 4 and 5. Logging slash will be strategically placed over and around some existing sites in all action alternatives and the slash barriers will be monitored to evaluate their effectiveness at affording Canada yew protection from deer browse. In Alternatives 1, 2, and 3 Canada yew would likely continue to exist in the project area at very low numbers. Unfenced yew would likely remain in a browsed state and would not reproduce.

Wildlife

RFSS - Northern goshawk. RFSS - Red-shouldered hawk (habitat only) - Issue 2: Because of their occurrence in the project area or the potential amount of habitat that could be impacted in the project area, northern goshawk and red-shouldered hawk were identified as Regional Forester Sensitive Species that could be impacted by the proposal and/or alternatives. For the woodland hawk species, there is currently no occupied habitat that would be impacted in any alternative. There are no known red-shouldered hawk nests in the project area. Based on impacts to unoccupied habitat, it was determined that Alternatives 1 and 2 would have no impact on these hawks and the determinations for Alternatives 3, 4, and 5 are “may impact individuals, but there would be no impact on population viability for this species”. This determination was made primarily from the acres of suitable nesting habitat that would become unsuitable for 5 years following treatment. For Alternatives 3, 4, and 5, habitat for the RFSS hawks is expected to increase under all of the Park Falls Hardwoods alternatives within 5 years of harvest by 1.7%, with a substantial decrease in suitable habitat (about 20-40%) immediately following harvest in Alternatives 3-5. In all alternatives, there is still more than 11,000 acres of suitable nesting habitat immediately following harvest activity which will increase to about 20,000 within 5 years, which is slightly more than the current amount of nesting habitat available in the project area (Chapter 3, Table 21 and Table 25) for goshawk and red-shouldered hawk.

Across the Medford-Park Falls District, there will be a very slight decrease in suitable goshawk nesting habitat within 5 years for Alternatives 3, 4, and 5, with a slight increase in habitat for Alternatives 1 and 2 (Table 8c). There would still be over 96,000 acres of suitable nesting habitat available for goshawk in all alternatives within 5 years of implementation at the District scale. It should be noted that decreases in goshawk nesting habitat at the District level is not a result of any alternative in the Park Falls Hardwoods project because there is an overall slight increase in suitable habitat at the project level (2-3%) within 5 years. This slight decrease on the District scale is attributed to “outgrowth” of aspen as suitable habitat for goshawk. Aspen that ages past 65 years old becomes unsuitable for goshawk nesting habitat. The amount of 50+ year old hardwoods (primary goshawk nesting habitat) on the Forest are continuing on a steady upward trend as indicated by Figure 9, Chapter 3.

RFSS - Little brown myotis, northern long-eared myotis, and tri-colored bat - Issue 2: These three species of bats are considered cave-dwelling species that spend a majority of their maternity and/or hibernation period in caves, mines, or similar structures. The greatest threat to hibernating bats is a disease called white-nose syndrome (WNS). This disease is named for the white fungus evident on the muzzles and wings of affected bats. White-nose syndrome has been associated with a recently identified

fungus (Geomyces destructans) that thrives in the cold and humid conditions characteristic of the caves and mines favored by bats. The affected bats will have low body fat, will move to colder parts of the hibernacula, will fly during the day and during cold winter weather when insects they feed upon are not available, and will exhibit other uncharacteristic behavior. The disease has resulted in the deaths of entire colonies. Since there are no caves or other winter hibernating features on the CNNF, only the summer foraging and nesting habitat would have any potential to be impacted in any alternative.

Direct or indirect impacts to the summer foraging and summer roosting habitat for the little brown myotis, northern myotis or the tri-colored bat are not anticipated in Alternatives 1-5. While individual summer roosting trees or trees for maternity colonies may be removed due to single tree harvest during the winter, bats returning to roost in the summer will still have suitable roosting habitat within or close to the same location as the previous year. Since there are no direct or indirect effects anticipated, there would be no cumulative effects on RFSS bats or their habitat in any alternative. More than 99% of the bat foraging and roosting habitat in the project area is maintained in all alternatives.

RFSS - Spruce grouse - Objective 10 (Issue 2): Enhancement of spruce grouse habitat is proposed in Alternatives 3, 4, and 5. This consists of planting black spruce in lowland hardwood stands proposed for harvest adjacent to lowland conifer wetland complexes and a portion of one stand that will emphasize retention of white spruce and reduction of balsam fir “thickets” during harvesting. There will be no direct or indirect impact to spruce grouse because there will be no impact to the area of spruce grouse sighting in 2007 and any minimal reduction in habitat (18 acres) is offset by habitat enhancement in most action alternatives. Alternative 2 is the only alternative that does not offset the 18 acres of long term habitat loss with habitat enhancement, and this loss only represents 0.7% of the suitable habitat. Overall, the spruce grouse habitat enhancement in Alternatives 3, 4, and 5 results in a very slight increase in habitat in the project area over the long term. Alternative 1 does not change the habitat over the long term.

MIS - Brook trout - Objective 11: Alternative 1 is not pro-active in reducing aspen and retaining long lived species that would be less palatable to beaver near coldwater fisheries. Alternatives 2-5 are pro-active in converting some acres away from early successional species to long-lived species, reducing the impacts from beaver over the long term. Based on the amount of the trout buffer zones treated in each action alternative there is little difference in how each meets the objective of improving trout fisheries. Because of ongoing road maintenance projects, all the alternatives will continue to reduce potential for sedimentation impacts to brook trout and other fisheries. For additional information on aquatics and cold water fisheries, see the Aquatic Resources section below.

Early successional wildlife - Issue 3: The importance of aspen to early successional wildlife species is based on both the long-term maintenance of the aspen type, and the amount of young age aspen. All alternatives represent a permanent loss of some habitat for ruffed grouse, American woodcock and golden-winged warbler from the reduction in total amount of aspen. However, the amount of young aspen (0-10 years old) actually increases in Alternative 4 to 705 acres from the current condition (663 acres), while Alternatives 1 and 2 show a marked decrease. Alternatives 3 and 5 are about the same as the existing condition for the amount of aspen that will be 0-10 years old in the area. See Table 8c. The amount of alder and upland openings is static for the short term, with the acres of upland openings declining over the long term. Though there is a loss of some early successional habitat in all alternatives, for the overall project area this represents a change in less than 1% of the total upland acres for all cover types into or out of early successional habitat from the current condition. In summary, all the alternatives maintain about the same amount of habitat for early successional wildlife species.

General wildlife – Coarse and fine woody debris - Issue 4: Traditional timber harvests have generally removed only wood greater than four inches in diameter from the bole of a tree. In biomass harvests, trunks and branches smaller than four inches in diameter could be harvested. Harvest of this material could impact small mammals, lichen, and fungi diversity and richness, and possibly allow for increased seedling and herb browse by white-tailed deer. There is currently about 3 dry tons per acre of woody debris on the forest floor in the project area. While biomass harvest removes wood products from the area, the treatments for biomass harvest also require leaving woody debris at the harvest sites. Table 8c shows the amount of woody debris that is expected (total dry tons per acre) following harvest in each of the action alternatives. Alternative 1 (No Action) would not have fine woody debris (FWD) removed or added to the forest floor through harvest operations, so the existing estimate of 3 dry tons/acre would

remain as the existing condition. Alternatives 2 through 5 would collectively have almost triple the FWD component in comparison to the existing condition. Because of the amount of biomass harvest in Alternative 5 (addition of biomass harvest in hardwood selection harvests), it is not quite triple the existing component of fine woody debris. Even assuming the worst case scenario for amount of FWD that would be crushed (50%) and not providing maximum wildlife habitat value, there is still more FWD deposited on average in each of the action alternatives compared to the existing condition and what would be present in the No Action alternative. All alternatives meet or exceed Forest Plan standards and guidelines and Wisconsin BHGs.

Soils

Soils - Issue 5: Because no actions are being taken in Alternative 1, there is no soil disturbance or detrimental soil disturbance projected. Alternatives 2 through 5 all have some detrimental soil disturbance occurring (97-182 acres, Table 8c), but the cumulative impact is the same for each alternative with respect to the percentage of the soils resource being maintained in a productive state (98-99%, Table 8c). In Alternatives 2-5, more than 99% of the proposed treatment areas are currently in good condition and soil properties are well within their natural range of variability. More than 98% of the treatment areas in Alternatives 2-5 would remain in a non-detrimentally disturbed condition, which meets National and Regional soil quality standards. Based on minimal direct and indirect effects on soil compaction, rutting, erosion, displacement, or productivity, Alternatives 2-5 would not impair long-term soil productivity.

Aquatic Resources

Aquatic Resources - Issue 6: Alternatives 2-5 have a range of 65-86 acres (Table 8c) that fall within the Riparian Management Zone (RMZ) with Alternative 5 having the most. Impacts are not likely in these zones due to the implementation of applicable standards and guidelines related to water quality. In all action alternatives, impacts to wetlands and water quality are similar. There are some harvest treatments that were proposed in forested wetlands for reducing the threat from emerald ash borer (EAB) in Alternatives 3, 4, and 5 (50-117 acres). Proposed EAB treatments would be monitored during project implementation to ensure contract specifications and design features are followed. If project design features are followed, no long-term detrimental water quality effects would be expected to occur from sedimentation or lateral sub-surface flow in wetlands in any alternative.

If Alternative 1 were implemented, up to 25 acres of the aspen habitat along classified trout streams would remain a favorable food source for beaver, potentially leading to vegetation removal. Removal of vegetation along riparian areas from beaver activity has the potential to increase water temperatures as well as reduce soil and bank stability creating an increase in sediment transport and impacting the overall stream channel morphology. Roads that are hydrologically connected to wetlands and streams would not be decommissioned in Alternative 1. These roads may contribute sediment or alter the hydrologic function of the connected wetlands and streams.

Transportation

Transportation - Objective 14 and Issue 7 (road density and public access): The effects of the no action alternative (Alternative 1) are that no transportation related actions would be implemented within the Park Falls Hardwoods project area. No changes or reductions would be realized in total and open road density. The existing condition would by default become the future condition. The total road density would remain 3.2 miles per square mile and the open road density would remain at 1.0 miles per square mile. Alternative 1 can be used as a comparison of the other alternatives to the existing condition.

The effects of implementing Alternatives 2-5 are that the future transportation system would provide the minimum local road system needed that is safe, affordable, has minimal ecological impacts, and would meet immediate and projected long-term public and resource management needs. Objectives would be met through a combination of routine road maintenance, new permanent and temporary road construction, road reconstruction, road decommissioning, conversion of roads to trails, and classification of existing unauthorized roads. Total road density would be less than 3.0 miles per square mile for the project area and does not differ substantially between Alternatives 2-5. Alternatives 2-5 increase open

road density in the project area from what is displayed on the 2009, 2010, and 2011 CNNF Motor Vehicle Use Map (MVUM) where desirable; however, the cumulative impact is still a reduction in open road density based on the Forest Plan FEIS published levels, and all action alternatives provide continued movement toward overall Forest goals for open road density. These patterns of reductions of total and open road densities are similar throughout the project area regardless of the MA, though MAs 8E, 8F, and 8G show the greatest reductions in total road densities. See Table 8c.

The roads identified for decommissioning in each action alternative are local terminal roads. They have been identified as having detrimental effects based on the Park Falls Hardwoods Roads Analysis or have been identified through field visits to experience little or no use. What is not illustrated by the amount or length of roads decommissioned or constructed (Table 8a) is that when implementation is complete, the future transportation system, would provide for an improved spatial arrangement of roads on the landscape. The addition of newly constructed roads within the project area in Alternatives 2-5 is more than offset by the levels of decommissioning.

Economic / Social Resources

Economic impacts to communities - Issue 8: Because there is no timber harvest in Alternative 1, there would be no revenue from the sale of wood products and no payments to counties generated from this project. In the action alternatives there is a range of potential revenue, volume, jobs, and receipts that increases from Alternative 2 to 5. Alternatives 2 and 3 are similar in the economic measures, both producing about the same amount of revenue, volume, jobs, and receipts, while Alternatives 4 and 5 are also very similar and close to double the revenues and volumes available in Alternatives 2 and 3. Because timber sale contracts are implemented over a period of years, these impacts would be realized over a period of years following approval of any of the alternatives. Actual impacts to communities such as a loss of revenues from National Forest timber sales may not occur in any of the alternatives. While Alternative 5 allows for almost double the harvest of Alternative 2, the combined CNNF timber sale program is expected to remain within the range of the last seven years of 70-80 MMbf per year. The Medford-Park Falls Ranger District share of this overall program has been 11-15 MMbf per year. With these assumptions, overall returns to the treasury and to counties would stay stable in each alternative or fluctuate based on the overall market for wood products.

Demand for Wood Products - Objective 13: All the action alternatives would make more timber and biomass available for harvest than currently exists. While Alternative 5 allows for the harvest of 84.9 MMbf and Alternative 2 allows for 43.6 MMbf, the combined CNNF timber sale program is expected to remain within the range of the last seven years of 70-80 MMbf per year. The Medford-Park Falls Ranger District share of this overall program has been about 11-15 MMbf per year. Regardless of the action alternative selected it is anticipated that harvest levels will remain steady across the District and Forest as a whole. Selection of an alternative that provides a higher volume of timber and biomass products would provide additional stability to the District sale program and purchasers of federal timber and biomass, in that the locations and approximate quantities of the next five plus years of timber sales would be known and all associated environmental analysis would be complete.

Alternative 5 is unique out of all the alternatives in the amount of biomass harvest. In Alternative 5, almost all the acres treated with a harvest prescription would be available for removal of a portion of the tree tops. The other alternatives limit biomass harvest to non-hardwood areas which is a much smaller fraction of the area than Alterative 5. Alternative 5 has about 6 times the biomass harvest volume than alternatives 2 and 3, and about 4 times the volume of Alternative 4. Based on the recently emerging demand for biomass, this difference may or may not be significant for meeting objectives for meeting demand. Challenges mentioned elsewhere (securing reliable and consistent supplies of biomass to justify capital intensive infrastructure investments and developing cost effective ways to collect and transport woody biomass) could render Alternative 5 the only viable alternative for biomass production. The other alternatives may have too little to make processing and transporting biomass cost effective.

Walking Trails - Objective 12: The trail designations are the same for all action alternatives: Foulds Creek Trail, 0.8 miles and Elk River Walking Trail, 4.9 miles. In Alternative 1 (No Action) no walking trails would be designated though any existing travel route would be available for foot travel.

Other Resources and Objectives

Understanding impacts of harvest on the atmospheric flux of carbon dioxide - Objective 1: In Alternatives 1, 2, and 3, there would be no selection harvest of the area within the footprint of the ChEAS tower. The selection harvest was not included in Alternatives 2 and 3 because it did not meet the criteria used to develop those alternatives. In Alternatives 4 and 5, there is proposed selection harvest in the footprint of the tower. The continued research with harvest treatments could provide detailed data needed for carbon cycle and climate change modeling activities. This could allow refinement of forest management activities to better respond to global warming issues. It is unlikely that research of this nature would occur in Alternatives 1, 2, or 3.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter focuses on the physical, biological, social, and economic environment of the project area and the effects of implementing each alternative on that environment. It provides additional background information (introduced in Chapter 1) and presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2. The purpose and need objectives and resource issues are discussed under the resource for which they relate. Each of the resource sections in this chapter contain discussions regarding the area affected; effects of past, present, and foreseeable actions; the existing condition of specific environmental components that may be affected by alternative actions; the direct and indirect effects of implementing the alternatives described in Chapter 2; and the cumulative effects of implementation. Conclusions drawn in this chapter identify any adverse effects that cannot be avoided along with any irreversible and /or irretrievable effects that may occur as a result of implementing the proposed management activities. A summary comparing the effects identified in this chapter is presented at the end of Chapter 2.

The level of detail in which each resource effect is discussed depends upon the character of the resource and the scale of analysis necessary to display the effects. Additional information regarding analysis methodology, background, and elaboration of the findings are available in the referenced specialist reports found in the project file. The project design features and Forest Plan standards and guidelines that are applicable to this project are listed in Appendix E.

The table shown below lists the major vegetation projects that have occurred across the Forest in the recent past, are being implemented currently, and some projects that are just beginning to be considered or analyzed (reasonably foreseeable projects). Impacts from past actions not listed here are generally assumed to be integrated in corporate databases and thus accounted for in the described existing conditions for the various resources discussed in this chapter. These are the projects that have been considered in any cumulative impact analysis for this project when relevant to determining a cumulative impact or difference between alternative impacts. Each resource identifies which projects may have been included and gives a brief description of why. In addition to the projects listed below, analysis at the project level may have identified some additional past or foreseeable actions that contribute to a cumulative impact. If that is the case, those actions are included in the resource analysis. No other vegetation management projects are planned for the next 10 years within the project area. If projects arose in this area, or other areas of the forest, their assessments would consider current projects as part of their disclosure of cumulative impacts.

Table 9: List of Forest Vegetation Management Projects (Past and Reasonably Foreseeable - 2011)

Project Name	***District***
Argonne Cutting Methods Study	Eagle River Florence
NW Howell	Eagle River Florence
Polecat Pine	Eagle River Florence
Grubhoe	Eagle River Florence
Longrail	Eagle River Florence
Fishel	Eagle River Florence
Tucker Salvage	Eagle River Florence
Phelps	Eagle River Florence
Cayuga	Great Divide
Twentymile	Great Divide
Great Divide Red Pine Thin	Great Divide
Twin Ghost	Great Divide
Boulder	Lakewood-Laona

Table 9: List of Forest Vegetation Management Projects (Past and Reasonably Foreseeable - 2011)	
Project Name	***District***
Quad-County Tornado Salvage	Lakewood-Laona
Flower Lake	Lakewood-Laona
Plantation II	Lakewood-Laona
Honey Creek-Padus	Lakewood-Laona
Lakewood-Laona Biomass Study	Lakewood-Laona
Lakewood Southeast	Lakewood-Laona
McCaslin	Lakewood-Laona
Camp Four	Medford-Park Falls
Medford Aspen	Medford-Park Falls
Hoffman Sailor West	Medford-Park Falls
2009 Medford Spruce Thin	Medford-Park Falls
Riley Wildlife Management Area	Medford-Park Falls
Park Falls Hardwood	Medford-Park Falls
Kirtland's Warbler Habitat	Washburn
Fishbone	Washburn
NW Sands	Washburn
Washburn Red Pine Thinning	Washburn
Early Successional Habitat Improvement	Multiple Districts

Forest Vegetation

Chapter 1, (Current Forest Plan Direction and Existing Conditions) includes a general description and condition of the vegetation within the Park Falls Hardwoods project area. This section of Chapter 3 includes more details on vegetation characteristics that could change as a result of implementing the alternatives and are described for the significant issues and objectives identified in Chapter 1, Issues / Objectives.

In 2011, a review of the Regional Forester Sensitive Species (RFSS) list was conducted and several species that were analyzed for this project are no longer considered to be potentially trending to federal listing and have been removed from the RFSS list (December 2011). Other species were added to the RFSS list. For this DEIS and the supporting biological evaluations and addendums, any species that was added to the list was analyzed and the biological evaluations for this project were updated (Project Files: Biological Evaluation – Plants for the Park Falls Hardwoods Project; Addendum to Draft Biological Evaluation; and supporting files). Species removed from the RFSS list still appear in this document as RFSS. Regardless of their status as an RFSS, Forest Plan standards and guidelines would still apply as indicated in Appendix F. Plants removed from the RFSS list include assiniboine (stoloniferous) sedge (Chapter 3, Forest Vegetation Section), northern wild comfrey (Appendix C), sheathed sedge (Appendix C), and white adder's mouth (Appendix C). Plants added to the RFSS include northern bur-reed (Chapter 3, Forest Vegetation Section), pale moonwort (Appendix C), two headed water-starwort (Appendix C), and Smith's melicgrass (Appendix C).

Ash composition and forest resiliency to emerald ash borer (EAB).

Objective 2

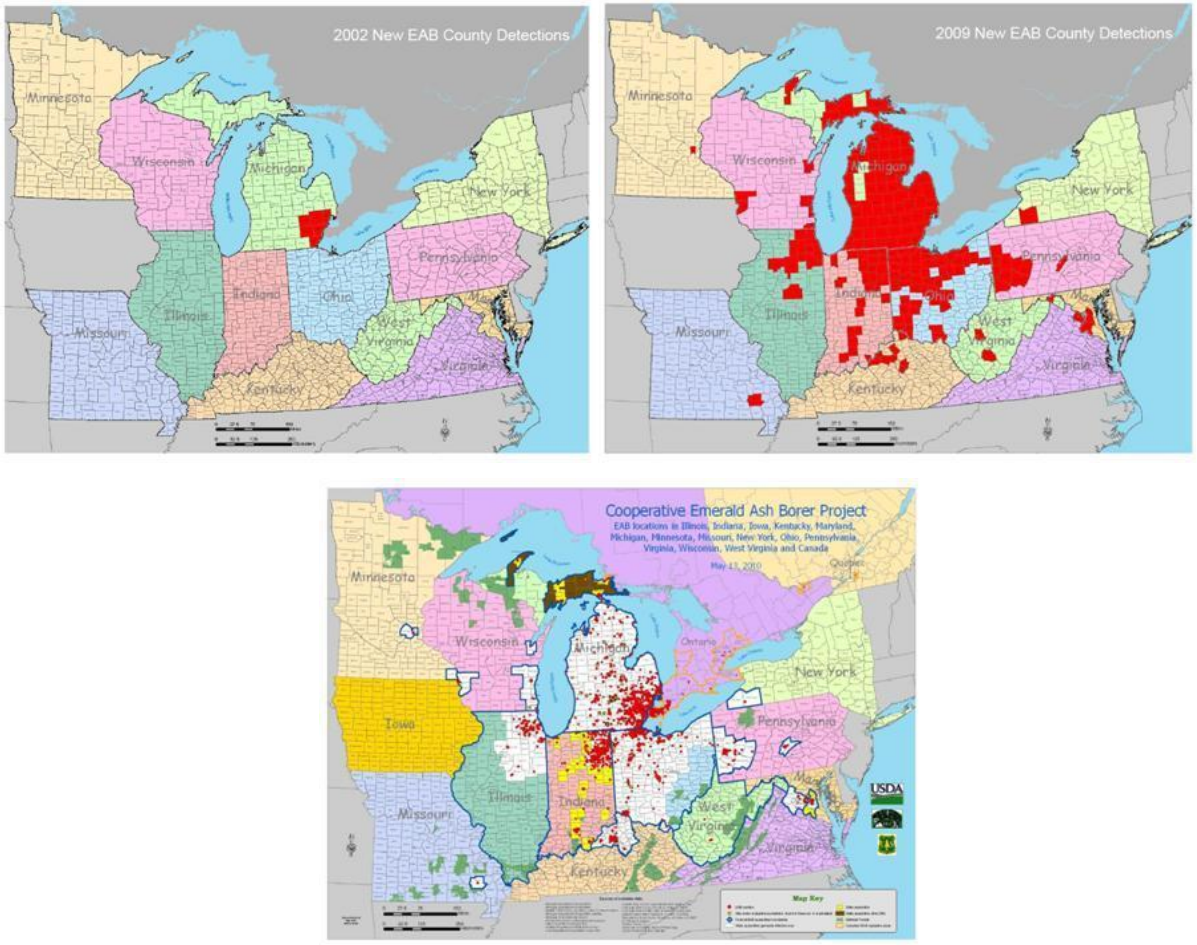
Emerald ash borer is an introduced insect that has the potential to devastate all native ash species similar to what occurred to the American chestnut and American elm. Without native control organisms, emerald ash borer quickly builds its population to a level that leads to mortality of any native ash. For this reason, one of the objectives of the proposal is to implement a treatment strategy to reduce or slow the spread of emerald ash borer: Information for this issue has been summarized from the Project File (PF), Forest Vegetation Resource Report, and supporting files.

Affected Environment / Area

EAB, an exotic invasive wood borer, was first discovered in Michigan in 2002. It is estimated 40 million ash trees have died in Michigan over the past eight years. In 2010, Iowa was added to the list of states confirmed with EAB. EAB currently exists in 14 other states and two Canadian provinces. In 2008, EAB was confirmed in Wisconsin but is not on the Chequamegon-Nicolet National Forest to date. Figure 1 illustrates the rapid spread of EAB within the past 8 or so years.

Ash is a component on an estimated 18,439 acres of upland northern hardwood and lowland hardwood stands within the project area. While emerald ash borer presence has not been confirmed on the Forest, its presence has been confirmed in Wisconsin. All ash is susceptible to EAB as this wood borer can quickly build its population to a level that leads to mortality of any ash species. Once established, mortality rates are expected to be approximately 99.0 – 99.9%.

Figure 1: Emerald Ash Borer, 2002, 2009, 2010- (Katovich 2010)



Once EAB is established in an area, the amount and density of ash on the landscape has an effect on how rapidly a population can build, travel to new areas containing ash, and cause widespread mortality. When the potential food source (i.e. ash phloem) levels are high and well distributed across the landscape, any EAB population that could be established has the potential to quickly increase and rapidly spread from tree to tree and across the landscape.

The objective of treating stands with an ash component is to reduce the overall amount and/or density of ash in the project area which reduces the desired food source for EAB and thus slows infestation and ash mortality if EAB becomes established within or adjacent to the project area.

The affected area for determining the effectiveness of treating ash to reduce the rate of spread and to increase resiliency of the area to EAB is the Park Falls Hardwoods project area and includes the areas of

MA 8E, F, and G. These areas were included even though they are not being treated, because of their location within the MA 2B area and because they are areas that would be most susceptible to rapid spread and mortality if EAB were to become established.

Cumulative Impact Boundary

The cumulative impact boundary for this objective is the project area. While there are other areas of the Forest that are susceptible to EAB, only actions within the project area are relevant to determining how the objectives for this proposal are being met.

Past and Reasonably Foreseeable Actions

Past actions that may have impacted the amount and location of ash within the project area (the two factors relevant to this issue) are accounted for by the current location and amount of ash within the area. There are currently no planned (foreseeable) actions within the project area that would include activities that could change the amount or location of ash within the area.

Measures

The total acres treated to improve forest resiliency from EAB (reduction of the ash component within hardwood stands per the Ash Management Strategy for the Chequamegon-Nicolet National Forest and the June 5, 2009 Memo for implementation) and the juxtaposition of treated areas to untreated areas (spatial location of areas susceptible to rapid EAB spread) are the measures used for comparison of the alternatives. The result expected from implementing the 2009 Strategy for EAB (USDA Forest Service, 2009a) within the analysis area is to reduce the amount of ash on the landscape which in turn will have an effect on how rapidly a population can build and travel.

Direct/Indirect/Cumulative Impacts

Because EAB presence has not been confirmed within or adjacent to the project area, there are no direct impacts for improving the resiliency of the forest to EAB. The indirect impact for improving resiliency to an EAB infestation would be the amount of the area treated to reduce the ash component. This would potentially reduce the amount of food source in the project area for EAB. The locations of these treatments are also important for the indirect impact of improving resiliency to EAB. Because there are no foreseeable projects that would impact the ash component within the project area, the cumulative impact is the same as the indirect impact.

Under Alternative 1 (the No Action Alternative), current ash stocking levels and species composition would remain unchanged. Therefore, potential forest risk to EAB remains unchanged. It is estimated that ash is a component on 18,439 acres within northern hardwood and lowland hardwood stands of the project area. Under this scenario, if EAB became established in the project area, it is very likely widespread mortality would occur within five years and EAB would rapidly move through the project area and beyond, potentially causing changes in forest and riparian ecosystems, especially where ash is the primary forest component. Appendix G includes an Emerald Ash Borer Risk Map for this and the other alternatives. Areas that are untreated and have an ash component are the most susceptible to rapid EAB spread and ash mortality.

Alternative 2 proposes 6,707 acres of selection harvests which will incorporate the guidelines outlined in the Forest's 2009 Ash Strategy to increase forest resiliency. A total of 6,707 acres will be treated to decrease the amount of ash phloem as well as encourage the diversity of other (non-ash) species. There are about 18,439 acres with an ash component within the project area, leaving about 11,732 acres untreated for EAB. Under this scenario, if EAB was confirmed within the project area, it is likely that widespread mortality of ash would occur within five years due to the amount of "untreated" acreage. The juxtaposition of treated areas to untreated areas can be seen visually on the Alternative 2 EAB Risk Map in Appendix G. As can be seen on the map, the patchwork of untreated vegetation would allow for a somewhat mobile wood borer to easily establish itself, increase in density and travel throughout the project area leaving behind dead ash within five years and potentially causing changes in forest and riparian ecosystems, especially where ash is the primary forest component.

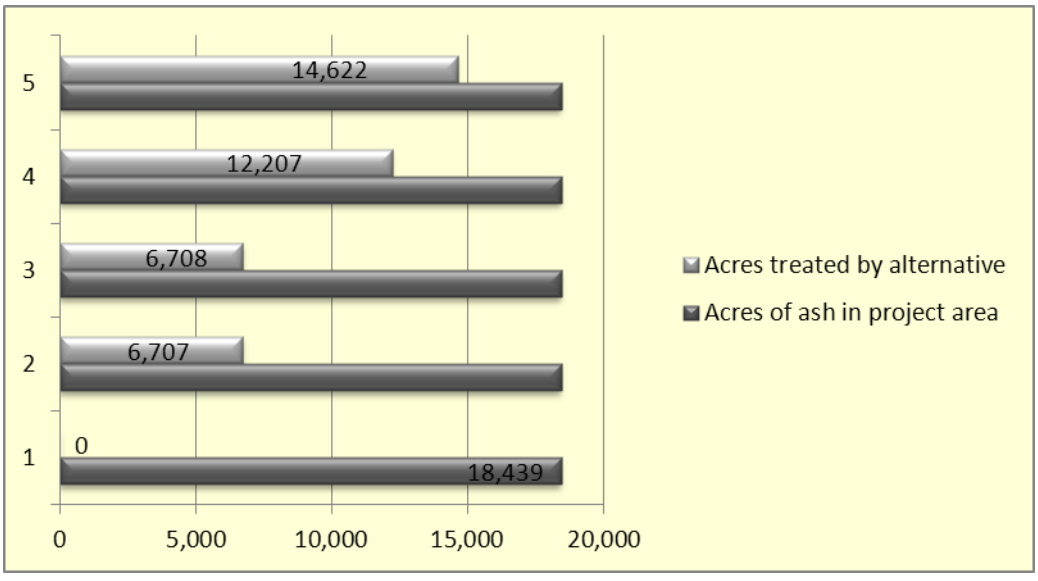
Alternative 3 proposes 49 acres of improvement cuts in lowland hardwoods and 6,659 acres of selection harvests that will incorporate the guidelines outlined in the Forest's 2009 Ash Strategy to increase forest resiliency. A total of 6,708 acres will be treated to decrease the amount of ash phloem as well as

encourage the diversity of other (non-ash) species. There are about 18,439 acres with an ash component within the project area, leaving 11,731 acres untreated for EAB. If EAB became established within the project area, it is likely that widespread mortality of ash would occur within five years due to the amount of "untreated" acreage. Visually, this can be seen on the Alternative 3 EAB Risk Map in Appendix G. As can be seen on the map, the patchwork of untreated vegetation would allow for a somewhat mobile wood borer to easily establish itself, increase in density and travel throughout the project area leaving behind dead ash within five years and potentially causing changes in forest and riparian ecosystems, especially where ash is the primary forest component. Also, as the connectivity of untreated area shows, this alternative allows high mobility through the EAB food sources resulting in high populations and high mortality.

Alternative 4 proposes 117 acres of improvement cuts in lowland hardwoods and 12,071 acres of selection harvests that will incorporate the guidelines outlined in the Forest's 2009 Ash Strategy to increase forest resiliency. A total of 12,188 acres will be treated to decrease the amount of ash phloem as well as encourage the diversity of other (non-ash) species. There are about 18,439 acres with an ash component within the project area, leaving 6,368 acres untreated for EAB. This alternative shows a major shift upward in acres of treated forest with an ash component. Visually, this can be seen on the Alternative 4 EAB Risk Map in Appendix G. The connectivity of the untreated areas is broken and isolated by treated areas. While there still could be mortality of ash within five years of establishment, the mobility and speed of an infestation would be reduced, allowing additional time for development of EAB control measures that could further reduce the potential threat of EAB to forest and riparian ecosystems.

Alternative 5 proposes 117 acres of improvement cuts in lowland hardwoods and 14,505 acres of selection harvests that will incorporate the guidelines outlined in the Forest's 2009 Ash Strategy to increase forest resiliency. A total of 14,622 acres will be treated to decrease the amount of ash phloem as well as encourage the diversity of other (non-ash) species. There are about 18,439 acres with an ash component within the project area, leaving 3,817 acres untreated for EAB. Under this scenario, the configuration of treated acres vs. untreated areas (see Alternative 5 EAB Risk Map, Appendix G) suggests EAB would not be able to travel unimpeded to vast areas of ash. Even where blocks of untreated ash (unprotected) exist, it is surrounded by vegetation treatments that will implement the 2009 Ash Strategy which would impede insect movement. While there still could be some mortality of ash within five years of establishment, the mobility and speed of an infestation would be limited, allowing additional time for development of EAB control measures that could further reduce the potential threat of EAB to forest and riparian ecosystems.

Figure 2 – Acres Treated to Reduce Ash Density



Both spatially and with the amount of treated acres, Alternative 5 has the least risk for rapid spread of EAB (see Figure 2 and Alternative 5 EAB Risk Map, Appendix G). Spatially, the juxtaposition of treated areas to untreated areas, the treated areas are located throughout the entire analysis area and provide isolation of "unprotected areas" such as 8E, 8F, 8G and 6B MAs. As a comparison, the action alternative which appears to leave more unprotected ash on the landscape is Alternative 3. Although Alternatives 2 and 3 treat similar acreages, spatially, the configuration of untreated stands in Alternative 3 appears to show more EAB risk potential because of the connectivity of the untreated stands. Alternative 1, the No Action Alternative, does not meet the need for increasing resiliency to an EAB infestation. In Alternative 1, EAB, once established, would be expected to move quickly throughout the project area and widespread mortality could be expected within five years.

Wind and disease damaged forest.

Objective 3

There are some acres within the project area that have spruce which has been impacted by spruce decline (about 62 acres). Spruce decline is a host of diseases and other stress factors which results in the death of spruce. There is also some aspen in the project area which has been impacted by wind (about 18 acres). Salvage and regeneration treatments would return these areas to a healthy, productive, and more resilient forest. Information for this issue has been summarized from the Project File (PF), Forest Vegetation Resource Report, and supporting files.

Affected Environment / Area

There are 80 acres which have been identified in the analysis area that have been impacted by wind and disease. Specifically, spruce decline is killing 62 acres of spruce and 18 acres wind damaged aspen has been identified.

The affected area for determining the effectiveness of treating diseased and wind damaged areas is the MA 2B portion of the Park Falls Hardwoods project area. The included areas of MA 8E, F, and G are not part of the affected area because these are areas that have different objectives that include allowing most damaged areas to go unsalvaged.

Cumulative Impact Boundary

The cumulative impact boundary for this objective is the project area. While there are other areas of the Forest that are susceptible to damage from wind, insects, or disease, only actions within the project area are relevant to determining how the objectives for this proposal area being met.

Past and Reasonably Foreseeable Actions

Past actions that may have impacted the amount of wind and disease damage within the project are accounted for by the current location and amount of damage. There are currently no planned (foreseeable) actions within the project area that would include activities that could change the amount of wind or disease damaged forest.

Measures

The measure is the number of acres treated to return wind and disease damaged forests to a healthy and productive state.

Direct/Indirect/Cumulative Impacts

Alternative 1 (No Action Alternative) treats zero acres therefore there is no change in forest health condition from the present state. No substantial adverse effect is expected as a result of taking no action. This is because the amount of wind and disease damaged forest is only a small portion of the project area (80 acres) and all of the damaged areas could be expected to eventually regenerate to native species over time.

In Alternatives 2, 4, and 5, 100% of the existing need, 80 acres, of windblown and disease damaged forest will be treated to increase health and productivity.

In Alternative 3, 95% of the existing need, 76 acres, of windblown and disease damaged forest will be treated to increase health and productivity.

Overall, all the alternatives, including the No Action alternative would meet this objective. In the No Action alternative, although it may take many more years than in the other alternatives, wind and disease damaged forest would return to a healthy, productive state.

Forest tree stocking levels.

Objective 5

The project area has had minimal active management for the last 2 1/2 decades. For the most part, vegetation management has been limited to salvage and regeneration treatment of areas damaged through natural events such as wind, ice, and insect and disease infestation. Most of the mid to late successional upland forest within the project area is well over the stocking levels prescribed in the Forest Plan to maintain forest health, productivity, and resiliency. For this reason, thinning, selection and other types of harvest were proposed to reduce stocking levels to a more productive state. Information for this issue has been summarized from the Project File (PF), Forest Vegetation Resource Report, and supporting files.

Affected Environment / Area

The affected area for determining the effectiveness of treating overstocked areas is the MA 2B portion of the Park Falls Hardwoods project area. The included areas of MA 8E, F, and G are not part of the affected area because these are areas that have different objectives that include allowing the forest to develop with very limited intervention.

Cumulative Impact Boundary

The cumulative impact boundary for this objective is the project area. While there are other areas of the Forest that are undergoing vegetation management to reduce stocking levels, only actions within the project area are relevant to determining how the objectives for this proposal area being met. Only National Forest System land was considered. Activities on private lands are not subject to Forest Plan or project objectives.

Past and Reasonably Foreseeable Actions

Past actions that may have impacted the amount of overstocked stands within the project area are accounted for by the current stocking levels. There are no planned (foreseeable) actions within the project area that would include activities that could change forest density/stocking.

Measures

Thinning operations, overstory removals and selection harvests decrease stocking levels therefore the measure is acres treated by these three harvesting methods.

Direct/Indirect/Cumulative Impacts

Alternative 1 treats zero acres therefore there is no improvement to the health and vigor of the forest through reducing the stocking of overstocked stands. On about 15,000 acres within the MA 2B portion of the project area, competition for resources would continue to contribute to less resilience from stressors such as drought, disease, and insect infestation.

In Alternatives 2 and 3, selection harvesting, commercial thinning and overstory removal treatments in overstocked stands will improve the health and vigor of the forest on about 7,000 acres. Competition for resources would continue to contribute to less resilience from stressors such as drought, disease, and insect infestation on untreated / overstocked acres (about 8,000 acres).

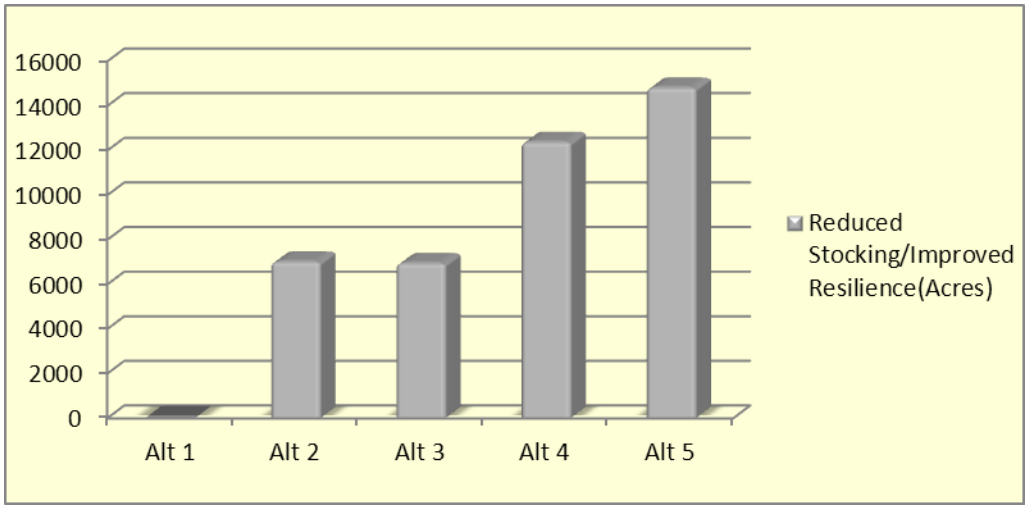
In Alternative 4, treatments in overstocked stands will improve the health and vigor of the forest on about 12,000 acres. Competition for resources would continue to contribute to less resilience from stressors such as drought, disease, and insect infestation on untreated / overstocked acres (about 3,000 acres).

In Alternative 5, treatments in overstocked stands will improve the health and vigor of the forest on about 15,000 acres. Competition for resources would be reduced on all acres of overstocked stands in this alternative which in turn increases resilience from stressors such as drought, disease, and insect infestation.

Table 10: Acres of Stocking Reduction Treatments (by Alternative)					
Treatment	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**
Selection	0	6,707	6,659	12,071	14,505
Thinning	0	146	126	146	146
Overstory Removal	0	160	158	160	160
Total	**0**	**7,013**	**6,943**	**12,377**	**14,811**

In summary, selection harvesting, commercial thinning and overstory removal treatments in overstocked stands will improve the health and vigor of the forest which in turn increases resilience from stressors such as drought, disease, and insect infestation. Alternatives 4 and 5 meet this need by treating most of the acres that are in an overstocked state. Alternatives 2 and 3 meet this need on less than half of the acres, and Alternative 1 does not meet this need (Table 10 and Figure 3).

Figure 3 – Acres Treated to Reduce Forest Stocking Levels



Forest composition (amount of aspen types).

Objective 6

For MA 2B, Chapter 3 of the Forest Plan identifies a desired condition for aspen of a maximum of 10% of the upland forest. The existing condition is that aspen comprises about 25% of the upland forest type in MA 2B within the project area. For this reason, treatments that reduce the amount of aspen were proposed. Information for this issue has been summarized from the Project File (PF), Forest Vegetation Resource Report, and supporting files.

Affected Environment / Area

The Park Falls Hardwood Project Area is divided into Forest Plan Management Areas (MAs) with associated desired conditions as outlined in the Forest Plan. The MAs which comprise the project area are displayed visually on the Park Falls Hardwoods Project Management Areas Map in Appendix G.

Management Area 2B: Management Area 2B is the primary MA within the project area. According to the Forest Plan (2004), the desired landscape in MA 2B is to have a relatively continuous mid to late successional uneven-aged northern hardwood and northern hardwood hemlock forest. Early successional forest patches are generally allowed to succeed or treated so as to encourage conversion to long-lived species. MA 2B has specific desired forest vegetation composition. As shown in Table 11, aspen is the only upland species outside the desired range and exceeds the desired upper limit by 15% within MA 2B. The 25% of aspen is about equitable to 6,049 acres.

Aspen, an early successional species, regenerates naturally after clearcutting as well as after catastrophic events such as wind and ice storms. As a result of these past events in the project area,

there is an overabundance of this early successional species. Over very long periods of time and without catastrophic events, aspen will eventually be replaced by later successional tree species such as mixed northern hardwoods. Therefore, for purposes of the analysis, it is assumed that the aspen type changes to a longer lived species type at age 80. In reality, this conversion (i.e. natural succession of aspen) would just be starting and could take several decades.

In aspen over 35 years old, there is a potential to treat the aspen with a harvest which removes only some of the trees and leaves light conditions on the forest floor that are conducive to regeneration of later successional tree species. These types of treatments (improvement cut or shelterwood cut) – with or without underplanting - would nudge the understory in the desired direction making it less likely that the stand would regenerate back to aspen when the remaining aspen overstory dies off. These aspen stands already have a component of other tree types (mixed hardwoods or pine) that would remain following harvest and also contribute to the conversion of these areas to a later successional forest type.

Table 11: Percentage of Upland Forest Type within MA 2B

Upland Forest Type	Existing %	Desired %
Aspen	25	0-10
Balsam fir	1	0-3
Paper birch	2	0-2
Jack pine	0	0-2
Red/White pine	<1	0-10
Northern hardwoods	69	50-80
Oak	<1	0-3
Permanent openings	<1	0-1
Other upland forest types	<2	0-15

Management Areas 8 E, F, G: About 10% of the National Forest lands in the project area are within Management Areas 8E, F or G. These areas do not have specific goals or objectives for upland forest vegetation types, so only the MA 2B portion of the project area is included as the affected area for this objective / issue.

Cumulative Impact Boundary

The cumulative impact boundary for this objective is also the MA 2B portion of the project area. While other activities may be happening within MA 2B on other parts of the CNNF, only the actions happening within this project area are relevant to determining if this objective is being met. If the trajectory of the forest composition (aspen amount) is moving towards the desired condition (less aspen), then there is no need to look outside the project area. Only National Forest System land was considered. Activities on private lands are not subject to Forest Plan or project objectives.

Past and Reasonably Foreseeable Actions

The existing forest type composition within the affected area is a direct result of past actions within the project area. These actions include past timber harvest and salvage activities. These harvest activities have been relatively minor within the past 20 years and are limited primarily to salvage activities from wind storms and disease. See Chapter 1, Project Area History for further description of past events which have contributed to the existing vegetation conditions.

There are no other reasonably foreseeable (planned) projects being considered for this area. Even though there is no reasonable foreseeable timber harvest that would result in changes to forest type, there are natural processes that are occurring over time that would be taken into account for this objective. This report assumes aspen conversion from natural processes will occur at age 80. Aspen is not a long-lived species. After 50-70 years, aspen stands begin to deteriorate. The onset of this can be observed when the crowns of the older trees can no longer grow fast enough to fill voids in the canopy left

by dying trees (Forest Plan FEIS Appendix F, p. F-4). By age 60-80 years, many aspen trees will have died and succession to more shade-tolerant species would begin (Katovich, McDougall and Chavez, 1998).

Measures

The change in acres of aspen by alternative will be used as a measure. Aspen is the only species within the early successional group that is outside the desired MA 2B range. Therefore, aspen is the only species analyzed for this issue / objective.

Direct/Indirect/Cumulative Impacts

In Alternative 1, the 6,049 acres of aspen will remain basically the same. Although no active management occurs under the No Action Alternative, aspen decreases over time due to natural successional changes. Currently, there are 67 acres of aspen older than 80 years in the analysis area. In five years, there will be an additional 103 acres of aspen that reaches the 80+ age class and in 15 years there will be an additional 296 acres for 466 cumulative acres. This specifically represents the amount of the aspen type that will be reduced in the No Action alternative.

Table 12 shows the cumulative reduction of aspen acres that could be expected in each alternative over the long term (15 years). For Alternative 1 (the No Action Alternative), reduction of the aspen type is solely the result of natural succession of the older aspen within the analysis area.

Table 12: Cumulative Aspen Acres Decrease in 15 Years

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Aspen Treated for Conversion	0	835	985	730	1,011
Natural Succession of Aspen	466	6	32	66	6
TOTAL:	**466**	**841**	**1,017**	**796**	**1,017**

In Alternative 2, aspen conversions are planned for 835 acres. As a result, 382 acres of aspen will convert to more long-lived species within the first 5 years. The remaining 453 acres are assumed to convert by year 15 for a total of 835 acres of later successional forest type. These conversions are a result of harvest treatments designed specifically to convert aspen to longer lived species. Cumulatively, aspen acreage is reduced in two ways: as a result of management conversions and natural succession of 80 + year old aspen. These two mechanisms cumulatively result in 841 acres of aspen changing to either long lived hardwood or conifer in 15 years.

In Alternative 3, aspen conversions are planned for 985 acres, resulting in 357 acres of aspen converted to more long-lived species within the first 5 years. The remaining 628 acres are assumed to convert by year 15 for a total of 985 acres of later successional forest type. These conversions are a result of harvest treatments designed specifically to convert aspen to longer lived species. Cumulatively, aspen acreage is reduced in two ways: as a result of management conversions and natural succession of 80 + year old aspen. These two mechanisms cumulatively result in 1,017 acres of aspen changing to either long lived hardwood or conifer in 15 years.

In Alternative 4, aspen conversions are planned for 730 acres. In the short term (in 5 years), 357 acres of aspen will convert to more long-lived species. The remaining 435 acres are assumed to convert in 15 years. Therefore, by year 15 a total of 730 acres will be converted from aspen to another, later successional forest type. These conversions are a result of harvest treatments designed specifically to convert aspen to longer lived species. Cumulatively, aspen acreage is reduced in two ways: as a result of management conversions and natural succession of 80 + year old aspen. These two mechanisms cumulatively result in 796 acres of aspen changing to either long lived hardwood or conifer in 15 years.

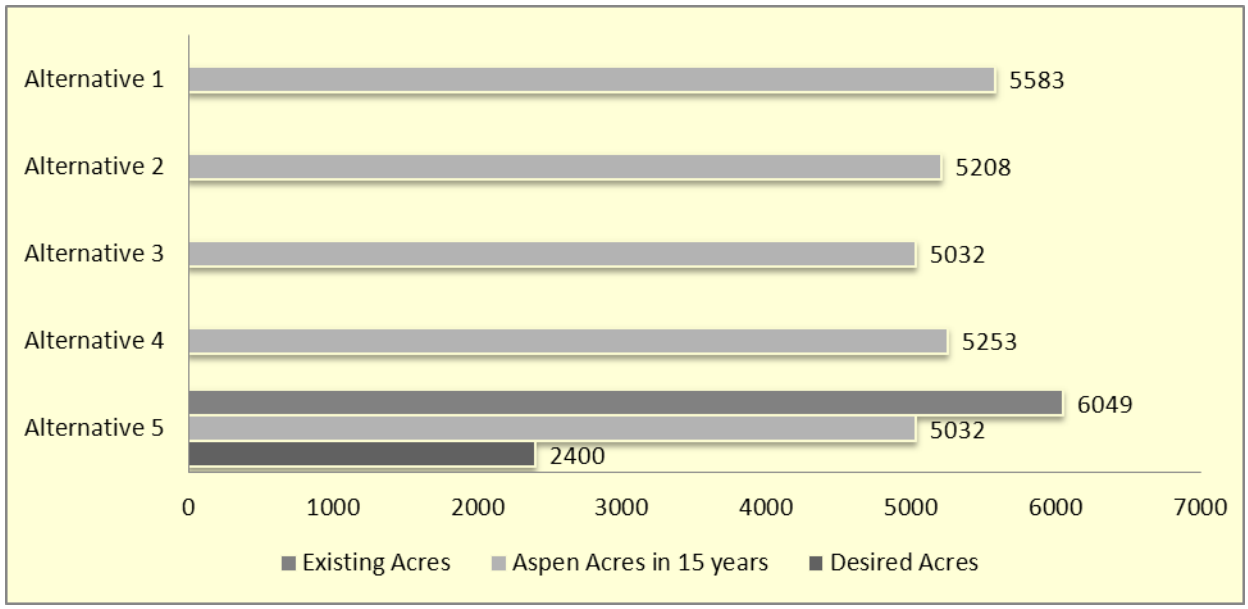
In Alternative 5, aspen conversions are planned for 1,011 acres, resulting in 382 acres of aspen converted to more long-lived species in the first 5 years. The remaining 629 acres are assumed to convert by year 15 for a total of 1,011 acres of later successional forest type. These conversions are a result of harvest treatments designed specifically to convert aspen to longer lived species. Cumulatively, aspen acreage is reduced in two ways: as a result of management conversions and natural succession

of 80 + year old aspen. These two mechanisms cumulatively result in 1,017 acres of aspen changing to either long lived hardwood or conifer in 15 years.

Table 13: 15 Year Cumulative Aspen Projection			
	Acres	**% Reduction**	**% of MA 2B Upland**
Alternative 1	5,583	2	23
Alternative 2	5,208	3	22
Alternative 3	5,032	4	21
Alternative 4	5,253	3	22
Alternative 5	5,032	4	21

In summary, all alternatives move the project area closer to the desired amount of aspen. Alternatives 3 and 5 reduce the amount of aspen by an amount that is about double of what natural succession would accomplish within a 15 year period (Table 13). Also, it should be noted that the aspen specifically treated for conversion in each alternative already has a vegetation component that makes conversion to that type likely within 15 years. Any natural succession conversions of aspen would just be starting in 15 years. For this reason, the action alternatives are more likely to reach the desired condition within the noted 15 year time frame.

Figure 4 – Acres of Aspen in 15 Years by Alternative



Aspen age class.

Objective 9

One of the objectives of the proposal was to maintain a more even age class distribution for aspen within the MA 2B portion of the project area. For this reason, some of the oldest aspen could be harvested with the intent of regenerating aspen in areas that would not break up larger hardwood blocks. This will produce a more even age class distribution of the early successional species remaining in the project area. Information for this issue has been summarized from the Project File (PF), Forest Vegetation Resource Report, and supporting files.

Affected Environment / Area

As described earlier, the MA 2B management prescription calls for upland forest of primarily mid to late successional species. While there is an overabundance of early successional species in the project area, the early successional species that are present are over represented in the older age groups, with limited representation in the youngest age groups (0-10 years of age). In managing early successional species, an even distribution across age groups is called for in the Forest Plan. Table 14 shows the distribution of the current aspen forest types among the various age classes along with a desired range.

Table 14: Existing Aspen Age Class Distribution

Age Class	Desired %	Existing %
0 to 10	15-25	11
11 to 20	15-25	6
21 to 45	45-55	57
46+	5-15	25

About 10% of the National Forest lands in the project area are within Management Areas 8E, F or G. These areas do not have specific goals or objectives for upland forest vegetation types or guides for age class distribution, so only the MA 2B portion of the project area is included as the affected area for this objective / issue.

Cumulative Impact Boundary

The cumulative impact boundary for this objective is also the MA 2B portion of the project area. While other activities may be happening within MA 2B on other parts of the CNNF, only the actions happening within this project area are relevant to determining if this objective is being met. If the trajectory of the aspen age class distribution is moving towards the desired condition (more regenerating aspen), then there is no need to look outside the project area. Only National Forest System land was considered. Activities on private lands are not subject to Forest Plan or project objectives.

Past and Reasonably Foreseeable Actions

As noted earlier, the existing forest type composition within the affected area is a direct result of past actions within the project area. These actions include past timber harvest and salvage activities. These harvest activities have been relatively minor within the past 20 years and are limited primarily to salvage activities from wind storms and disease. This can be readily seen in Table 15, which shows 82% of the aspen type to be over 20 years old.

There are no other reasonably foreseeable (planned) projects being considered for this area. There is no reasonably foreseeable timber harvest that would result in changes to aspen age class distribution,

Measures

The acres and percent of regenerating aspen (0-10 years old) and aspen age class distribution in 5 years are the measures for aspen age structure.

Direct/Indirect/Cumulative Impacts

Under Alternative 1, zero acres are treated and regenerated to aspen. Therefore, the age of the existing 6,049 acres of aspen within the analysis area is not affected. In order to show the impact of the no action alternative, Table 15 gives the estimated age class distribution for each alternative in 5 years. In Alternative 1, more aspen will move into the oldest age class with no recruitment into the youngest age class.

Alternative 2 regenerates 180 acres of aspen. In the short term (in 5 years), as a result of the amount of aspen that ages into the 11-20 year age class and the limited amount of aspen being recruited into the 0-10 age class, the 0-10 year age class moves even further from the desired condition of 20%.

Alternative 3 regenerates 369 acres of aspen. Alternative implementation will shift the youngest age class slightly closer to the Forest Plan's desired condition of 20% in the short term (2015). The youngest age class shifts upward from 11% to 12%.

Table 15: Aspen Age Class by Alternative (in 5 years)							
Aspen Age Class	**Desired %**	**Existing %**	***Alt 1* %**	***Alt 2* %**	***Alt 3* %**	***Alt 4* %**	***Alt 5* %**
0 to 10	15-25	11	4	8	12	13	12
11 to 20	15-25	6	8	9	9	9	9
21 to 45	45-55	57	60	63	65	62	65
46+	5-15	25	27	20	14	16	14
% based on acres of aspen:			6049	5213	5058	5284	4458

Alternative 4 regenerates 466 acres of aspen. Alternative implementation will shift the youngest age class closer to the Forest Plan's desired condition of 20% in the short term (in 5 years). The youngest age class shifts upward from 11% to 13%.

Alternative 5 regenerates 369 acres of aspen. Alternative implementation will shift the youngest age class closer to the Forest Plan's desired condition of 20% in the short term (in 5 years). The youngest age class shifts upward from 11% to 12%.

As a summary, Alternatives 3, 4 and 5 all move closer to the Forest Plan's desired condition for aspen age class distribution about equally, while Alternatives 1 and 2 move further away.

Northern hardwood forest age structure.

Objective 7

One of the objectives for northern hardwood forest in the Forest Plan and in this project is to develop and maintain large blocks of uneven-aged hardwood forest. The existing age structure of the existing hardwood forest is primarily even aged. In order to address this, there is a need to treat hardwood stands in order to develop an age structure. Information for this issue has been summarized from the Project File (PF), Forest Vegetation Resource Report, and supporting files.

Affected Environment / Area

The majority of the hardwood stands within the project area was established 70 to 80 years ago and is comprised of trees that are all about the same age. For MA 2B, Chapter 3 of the Forest Plan describes the desired condition for the area as mid to late successional , uneven-aged northern hardwood forests. As even-aged hardwoods mature and individual trees die, they may start to build an uneven age structure on their own. Selection harvests proposed would promote the development of uneven-aged conditions within the stand (through canopy gaps and recruitment of new regeneration). Since the stands proposed for this treatment are currently overstocked, the selection harvest would also improve overall health, vigor, and resiliency (as described above).

Within the MA 2B portion of the project area, there are about 16,510 acres of northern hardwood forest considered to be in an even-aged condition. Through single-tree mortality and wind events, canopy gaps can create conditions favorable for new age-class development. It is estimated the timeline to reach landscape level uneven-aged hardwood conditions under these conditions is greater than 100 years given the average age of the northern hardwoods within the analysis area is 73 years old and still considered even-aged.

About 10% of the National Forest lands in the project area are within Management Areas 8E, F or G. These areas do not have specific goals or objectives for upland forest vegetation types or guides for age structure, so only the MA 2B portion of the project area is included as the affected area for this objective / issue.

Cumulative Impact Boundary

The cumulative impact boundary for this objective is also the MA 2B portion of the project area. While other activities may be happening within MA 2B on other parts of the CNNF, only the actions happening

within this project area are relevant to determining if this objective is being met. If the trajectory of the northern hardwood age structure is moving towards the desired condition (uneven-aged), then there is no need to look outside the project area. Only National Forest System land was considered. Activities on private lands are not subject to Forest Plan or project objectives.

Past and Reasonably Foreseeable Actions

As noted earlier, the existing forest type and age structure within the affected area is a direct result of past actions within the project area. These actions include past timber harvest and salvage activities. These harvest activities have been relatively minor within the past 20 years and are limited primarily to salvage activities from wind storms and disease.

There are no other reasonably foreseeable (planned) projects being considered for this area. There is no reasonably foreseeable timber harvest activities that would result in additional changes to northern hardwood age structure.

Measures

Treatment of northern hardwood includes the implementation of canopy gaps to recruit a new age class, or cohort. Therefore, acres treated with a selection harvest will be used as a measure.

Direct/Indirect/Cumulative Impacts

There are 16,510 acres of northern hardwood forest within the analysis area considered to be in an even-aged condition. In Alternative 1 (No Action Alternative), zero acres are treated with selection harvests. As a result, current age class remains the same in the foreseeable future, though it is estimated that an uneven-aged structure would start to develop within 100 years.

In Alternative 2, selection harvesting on 6,707 acres (41% of the northern hardwoods) will move the area toward the desired uneven-aged condition through the implementation of canopy gaps which serve to create a new age class within a stand. On the treated acres, uneven-aged conditions would be reached in about 45 years. On the untreated acres of northern hardwood, it is estimated the timeline to reach uneven-aged hardwood conditions is greater than 100 years.

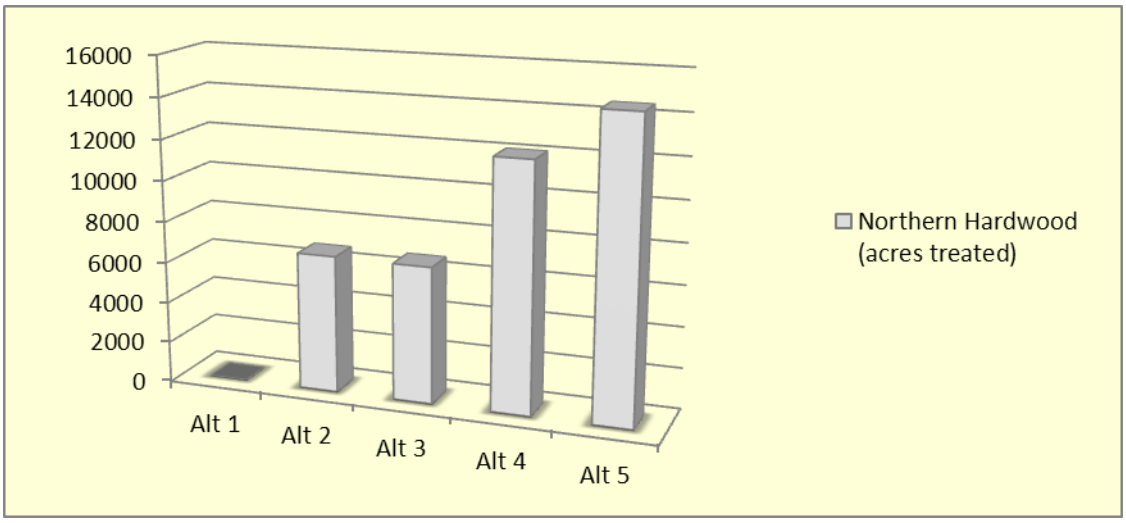
In Alternative 3, selection harvesting on 6,659 acres (40% of the northern hardwoods) will move the area toward the desired uneven-aged condition through the implementation of canopy gaps which serve to create a new age class within a stand. On the treated acres, uneven-aged conditions would be reached in about 45 years. On the untreated acres of northern hardwood, it is estimated the timeline to reach uneven-aged hardwood conditions is greater than 100 years.

In Alternative 4, selection harvesting on 12,071 acres (73% of the northern hardwoods) will move the area toward the desired uneven-aged condition through the implementation of canopy gaps which serves to create a new age class within a stand. On the treated acres, uneven-aged conditions would be reached in about 45 years. On the untreated acres of northern hardwood, it is estimated the timeline to reach uneven-aged hardwood conditions is greater than 100 years.

In Alternative 5, selection harvesting on 14,505 acres (88% of the northern hardwoods) will move the area toward the desired uneven-aged condition through the implementation of canopy gaps which serves to create a new age class within a stand. On the treated acres, uneven-aged conditions would be reached in about 45 years. On the untreated acres of northern hardwood, it is estimated the timeline to reach uneven-aged hardwood conditions is greater than 100 years.

In summary, all the action alternatives address the project need to develop uneven-aged northern hardwoods (Figure 5). Alternative 5 treats about 88% of the northern hardwoods that are in an even-aged condition. Most of the remaining hardwood stands that are untreated in this alternative are too young or the stocking level is too low to implement a selection harvest. Alternative 4 treats about 73% of northern hardwoods. Alternatives 2 and 3 treat about 40% of the northern hardwoods. Alternative 1 does not meet the need for moving northern hardwood stands from an even to an uneven-aged condition.

Figure 5: Northern Hardwood Selection Treatment Acres by Alternative



Northern hardwood patch size and continuous canopy conditions.

Objective 8

One of the primary goals / objectives for management of MA 2B is to maintain or restore areas of relatively continuous canopy conditions with large patches of northern hardwood and hardwood-hemlock forest. Information for this issue has been summarized from the Project File (PF), Forest Vegetation Resource Report, and supporting files. Also see the Management Indicator Habitat Report for additional information on mature, northern hardwood, interior forest conditions.

Affected Environment / Area

Much of the hardwood forest within the MA 2B portion of the project area is connected in large blocks. This is displayed in the Appendix G map titled "General Cover Type and Land Type Association (LTA) Map". There are some instances, particularly in the southern portion of the project area, where treatment of early successional forest to convert it to later successional species, could increase the potential for larger patches of the desired forest types (hardwoods, spruce, pine, hemlock, oak) while simultaneously reducing the less desired forest types (aspen, birch, fir). As stated earlier, improvement cuts in early successional forest would move these acres towards later successional species. As hardwood types increase in these areas, this will also expand the areas of continuous canopy, hardwood - hemlock forest in the analysis area. Currently the upland portion of MA 2B is comprised of about 17,139 acres of mid to late successional forest, the majority of which is northern hardwood. This represents 71% of the upland acres, which are the acres currently contributing to continuous canopy and large hardwood patches.

About 10% of the National Forest lands in the project area are within Management Areas 8E, F or G. These areas do not have specific goals or objectives for forest vegetation types or guides for large blocks of continuous canopy forest, so only the MA 2B portion of the project area is included as the affected area for this objective / issue.

Cumulative Impact Boundary

The cumulative impact boundary for this objective is also the MA 2B portion of the project area. While other activities may be happening within MA 2B on other parts of the CNNF, only the actions happening within this project area are relevant to determining if this objective is being met. If the trajectory of the forest canopy (continuous) is moving towards the desired condition (large patches), then there is no need to look outside the project area. Only National Forest System land was considered. Activities on private lands are not subject to Forest Plan or project objectives.

Past and Reasonably Foreseeable Actions

As noted earlier, the existing forest type and conditions within the affected area is a direct result of past history and management activities, particularly on upland forest. These actions include past timber harvest and salvage activities. These harvest activities have been relatively minor within the past 20 years and are limited primarily to salvage activities from wind storms and disease. It should be noted, that these types of events did result in some areas regenerating back to earlier successional species such as aspen. Much of the existing youngest age class of aspen within the project area is a result of these fairly recent events.

There are no other reasonably foreseeable (planned) projects being considered for this area. There are no reasonably foreseeable timber harvest activities that would result in additional changes to the amount and size of the northern hardwood / hemlock forest in the analysis area, though it is noted in the impacts that natural succession of aspen to later successional species continues regardless of any other activities.

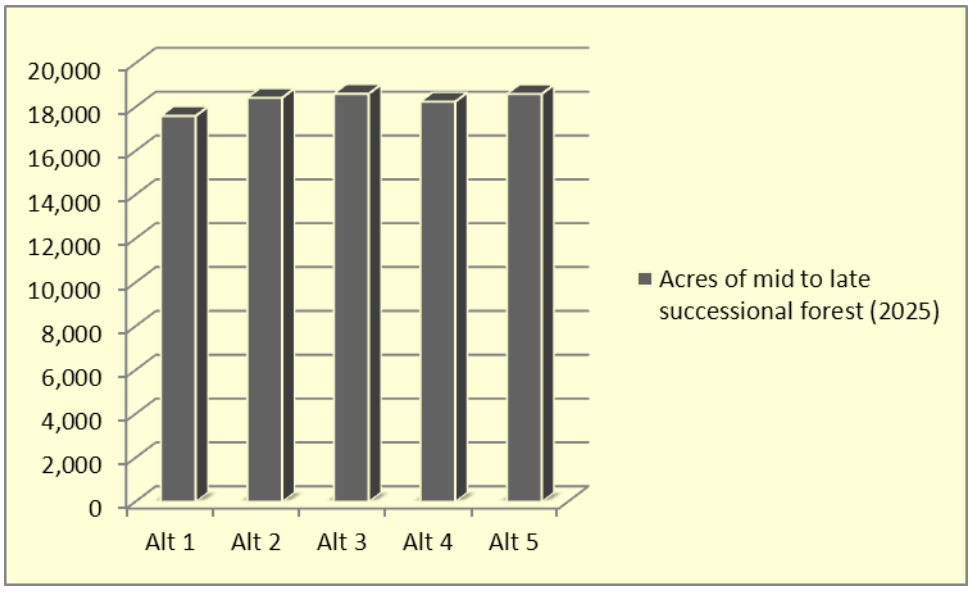
Measures

Early successional forest within the 2B MA is considered a "break" in continuous canopy conditions because it is treated with even-aged management when it reaches rotation age. It is a "temporary opening" until regeneration reaches a height of 12 feet and a vertical break in the overstory would not provide continuous canopy conditions. To address and measure this need, the acres reduced of early successional forest is the measure. Since the mid to late successional forest type is mostly northern hardwood types, the overall increase of mid to late successional forest type through natural succession within MA 2B over the next 15 years has also been projected as an indicator of continuous canopy.

Direct/Indirect/Cumulative Impacts

The measure, early successional habitat, would not be decreased under the No Action Alternative. However, through natural processes, the trend of early successional forest within the analysis area is expected to decrease by about 466 acres. This trend results in a slight increase of later successional species over time (about 3% over the next 15 years). Figure 6 shows the total acres of mid to late successional forest in each alternative.

Figure 6: Acres of Mid to Late Successional Forest



Alternative 2 proposes to decrease early successional forest by 1,291 acres through management conversions to either long-lived hardwood or conifer. The additional cumulative acres of reduction in early successional forest through natural succession results in an increase in continuous canopy conditions on about 1,297 acres over the next 15 years, which is an increase of 6% over the existing

condition (Table 16). This increase in mid to late successional species contributes to an overall increase of continuous canopy and slightly larger patches of northern hardwood forest.

Table 16: 15 Year Cumulative Increase in Mid to Late Successional Forest

	Acres	% Increase	% of MA 2B Upland
Alternative 1	17,605	3	74
Alternative 2	18,436	6	77
Alternative 3	18,617	6	77
Alternative 4	18,255	5	76
Alternative 5	18,606	6	77

Alternative 3 proposes to decrease early successional forest by 1,446 acres through management conversions to either long-lived hardwood or conifer. The additional cumulative acres of reduction in early successional forest through natural succession results in an increase in continuous canopy conditions on about 1,478 acres over the next 15 years, which is an increase of 6% over the existing condition (Table 16). This increase in mid to late successional species contributes to an overall increase of continuous canopy and slightly larger patches of northern hardwood forest.

Alternative 4 proposes to decrease early successional forest by 1,116 acres through management conversions to either long-lived hardwood or conifer. The additional cumulative acres of reduction in early successional forest through natural succession results in an an increase in continuous canopy conditions on about 1,116 acres over the next 15 years, which is an increase of 5% over the existing condition (Table 16). This increase in mid to late successional species contributes to an overall increase of continuous canopy and slightly larger patches of northern hardwood forest.

Alternative 5 proposes to decrease early successional forest by 1,467 acres through management conversions to either long-lived hardwood or conifer. The additional cumulative acres of reduction in early successional forest through natural succession results in an increase in continuous canopy conditions on about 1,467 acres over the next 15 years, which is an increase of 6% over the existing condition (Table 16). This increase in mid to late successional species contributes to an overall increase of continuous canopy and slightly larger patches of northern hardwood forest.

In summary, all alternatives move the project area closer to the desired condition of continuous canopy and large blocks of northern hardwood forest. Alternatives 2, 3, and 5 respond to this need with a 6 % increase in later successional species. Alternative 4, responds with a 5% increase and Alternative 1 (No Action) with a 3% increase. It should be noted that the aspen specifically treated for conversion in each alternative already has a vegetation component that makes conversion to later successional forest likely within 15 years. Any natural succession conversions of aspen would just be starting in 15 years. For this reason, the action alternatives are more likely to reach the desired condition within the noted 15 year time frame.

Rare Plants (Regional Forester Sensitive Species – RFSS)

Forestry practices include management activities such as harvesting, construction or use of skid trails, haul roads, and other related actions. These actions can cause soil disturbance across stands, increasing the potential for disturbing the duff layer and physically disturbing native vegetation. The Forest soil scientist developed an estimate, based on current literature, CNNF reviews and reports, that 13% of the soil in each stand (in acres) is disturbed from forestry practices (PF Soil Resource Report for the Park Falls Hardwoods Project). The effect of soil disturbance has been considered in the determination of effects to RFSS plants.

New road construction may affect RFSS species and native vegetation by adversely impacting the physical environment where native plants grow (Watkins et al., 2003). In the case of American ginseng,

roads may also increase the likelihood of illegal harvesting. New road construction also changes suited habitat to unsuited, reducing the acreage of habitat available to RFSS plants.

A pre-field screening identified that soils, habitat and forest cover type within the Park Falls Hardwoods project area could potentially provide habitat for the following RFSS plants species: the Bortrychium suite of mesic forest species, which includes Mingan's moonwort (Botrychium minganense), goblin fern (Botrychium mormo), and blunt-lobed grapefern (Botrychium oneidense), stoloniferous sedge (Carex assiniboinensis), spreading woodfern (Dryopteris expansa), butternut (Juglans cinerea), ginseng (Panax quinquefolius), and northern bur-reed (Sparganium glomerulatum). In addition, potential habitat for the Likely-to-occur RFSS plant, large toothwort (Cardamine maxima), was also identified. These eleven species were evaluated in further detail in the PF Biological Evaluation – Plants for the Park Falls Hardwoods Project or Addendum to the Biological Evaluation. Because of their occurrence and / or potential to be impacted by the proposed activities; stoloniferous sedge, American ginseng, and northern bur-reed are discussed below. See Appendix C for additional information on the other 8 species.

Intensive surveys on approximately 5,765 acres within the project area were conducted throughout the 2007 field season. While the above species were targeted for survey, all plant taxa listed on the Forest RFSS and LRFSS lists are included. New occurrences of stoloniferous sedge, ginseng, and butternut were located during these surveys and there are known extant occurrences of spreading wood fern, stoloniferous sedge and ginseng within the greater project area.

Information for rare plants has been summarized from the Project File (PF), Biological Evaluation – Plants for the Park Falls Hardwoods Project, and supporting files.

Regional Forester Sensitive Species (RFSS) – Northern bur-reed.

Issue 1

Individual plants could potentially be trampled by logging machinery or other soil disturbing equipment during harvest and road construction operations. Other threats to this species are focused on changes to water table or drying out of habitat from adjacent logging activities.

Affected Environment / Area

The northern bur-reed is found in cold ditches, pools in sedge meadows, willow-alder thickets and, occasionally, tamarack stands on the Lake Superior clay plain. It prefers full sun but can tolerate some shade. This species is mostly found in muddy or shallow water of swamps and ponds. While habitat availability or abundance for this species is wide-spread throughout the project area, the northern bur-reed within stands proposed for management is restricted to muddy or shallow water of swamps and ponds, cool ditches, and willow-alder thickets. Plant surveys conducted in 2007 and 2010 identified and delineated two occurrences of northern bur-reed in the project area.

Cumulative Impact Boundary

The cumulative impact boundary for this issue is Park Falls Hardwoods project area and includes MAs other than the 2B MA. While there are no harvest activities planned within the 8E, F, and G MAs, plant locations are not dependent on MA boundaries, so all MAs were included as applicable.

Due to limited dispersal distance, populations of this species are not likely to interact between landbases of the CNNF, between Ranger Districts, or between landbases on the same District, or even beyond the project area. The effects of the project will be contextualized by providing estimates of the proportion of occurrences of RFSS that are within this project area on land within the Forest Service boundary. When private lands contain portions of a known occurrence in the project area, it is considered in the effects to the degree that we know what's happening on the private land.

Past and Reasonably Foreseeable Actions

Beyond this project, there are no anticipated or planned projects that would affect suited northern bur-reed habitat within the effects boundary.

Measures

Measures for northern bur-reed include the populations within the project area and those within proposed harvest areas. Another measure is an estimate of the amount of suitable habitat potentially impacted.

Thresholds
The Species Viability Evaluation (SVE) process for the Forest Plan Revision did not establish minimum populations or other thresholds for this species since it was only recently established as an RFSS (December 2011).

Direct/Indirect/Cumulative Impacts
There are 2 documented occurrences of northern bur-reed in the project area, and both are located in wet areas within upland northern hardwood stands.

In Alternative 1, no activity would occur within the area in relation to this project. There would in turn be no direct or indirect effect to this species. Without direct or indirect effect, there would be no cumulative effect.

In Alternatives 2-5, a direct effect would occur if individual plants were trampled by logging machinery or other soil disturbing equipment during harvest operations. Northern bur-reed populations within stands selected for management would be protected by a 100 foot buffer zone that would preclude all timber harvest or ground disturbing activity and which would persist as an inclusion within the stand (Appendix E, Table E5, G178). Therefore, direct effects are not anticipated. An indirect negative effect would include actions making other-wise suited but unoccupied habitat unsuited. While habitat availability or abundance for this species is wide-spread throughout the project area, the northern bur-reed within stands proposed for management is restricted to muddy or shallow water of swamps and ponds, cool ditches, and willow-alder thickets. Protection of this habitat using Forest Plan guidelines and other design features will help maintain habitat as suited (Appendix E: Table E5; M129, G178, G224, and G386). In addition, the majority of the proposed management will occur during frozen conditions which will provide added protection to maintaining quality habitat for this species. Without direct or indirect effect, there would be no cumulative effect expected in Alternatives 2-5.

In summary, impacts to individual plants or plant colonies are not expected in any alternative. It is expected that most of the current suitable habitat would remain suitable habitat in all alternatives. Northern bur-read would not trend towards federal listing or lose viability in any alternative. Any impact would be inadvertent, such as trampling of individual undocumented plants that lie outside of buffer areas set up to protect plant populations from impacts.

Regional Forester Sensitive Species (RFSS) - Stoloniferous sedge.

Issue 1
Individual plants could potentially be trampled by logging machinery or other soil disturbing equipment during harvest and road construction operations. Changes or reduction in forest canopy closure may limit this species and/or make otherwise suitable habitat unsuitable.

Affected Environment / Area
Stoloniferous sedge occurs in northern hardwood forests dominated by sugar maple and basswood with lesser amounts of white or green ash, American elm and ironwood. Forest communities suited to stoloniferous sedge often contain a number of other Carex species, none of which are particularly similar (Penskar and Higgman, 1999). Soil types are typically silty to fine sandy loam, somewhat poor to moderately-well drained, mesic with a medium to rich nutrient regime. There appears to have been a dramatic increase of this species on the forest over the past decade with at least 127 known population “centers” for this species covering many acres and containing 10’s of 1000’s of individual plants. For the purposes of this report and because this species forms mats on the forest floor, population “centers” are defined as the center of the clump. Rare plant surveys within the Park Falls Hardwoods project area were initially conducted in 1999 with three populations of stoloniferous sedge noted. This was the first documentation of this species in Price County and on the Chequamegon part of the National Forest. In 2007, approximately 5,765 acres were surveyed in the project area resulting in six additional sites. Survey work in 2010 has lead to a tenth site within the project area.

Suitable or available habitat for stoloniferous sedge is defined by:

- Canopy cover and type (canopy cover of 80% or more and cover types range from predominantly sugar maple/yellow birch/beech, sugar maple/basswood, mixed hardwoods to the occasional aspen)
- Stand size density and age (stands that are 50 years or older in age and have a stand size density of 6 (poletimber more than 70% stocking) to 9 (sawtimber more than 70% stocking).
- Land Type Phases (LTPs) that are known to support this species.

Utilizing a Geographic Information System these 3 criteria were intersected and the model estimated that there is approximately 17,110 acres of suited habitat on the Park Falls landbase and 12,938 acres within the project area.

Occupied habitat was defined using information on the species dispersal mechanism, distance and number of individual plants at a single Element Occurrence (EO) site, and Habitat-based Plant EO Delimitation Guidance developed by NatureServe (NatureServe 2008). Given these considerations, occupied habitat can include the stand in which the EO is located and any adjacent stands of suited habitat that have an additional EO within 1 km of each other. If there is a single EO occurrence in a stand or limited information is available for the EO, then the whole stand will be considered occupied if the number of plants present and suitable habitat justify this inclusion.

Cumulative Impact Boundary

The cumulative impact boundary for this issue is Park Falls Hardwoods project area and includes MAs other than the 2B MA. While there are no harvest activities planned within the 8E, F, and G MAs, plant locations are not dependent on MA boundaries, so all MAs were included as applicable.

Due to limited dispersal distance, populations of this species are not likely to interact between landbases of the CNNF, or even between Ranger Districts. The effects of the project will be contextualized by providing estimates of the proportion of occurrences of RFSS that are within this project area and the Park Falls landbase on land within the Forest Service boundary. When private lands contain portions of a known occurrence in the project area, that is considered in the effects to the degree that we know what's happening on the private land.

Past and Reasonably Foreseeable Actions

Beyond this project, there are no anticipated or planned projects that would affect suited stoloniferous sedge habitat within the effects boundary.

Measures

The measure for stoloniferous sedge is the change in suitable habitat acreage as a result of the proposed actions. Analyses will differentiate between currently occupied habitat (direct effect) and suitable but unoccupied habitat (indirect effect).

Thresholds

In the Species Viability Evaluation (SVE) process for the Forest Plan Revision, no minimum numbers of plants or plant patches or its habitat were identified. Overall the SVE, which analyzed Alternatives 3-9 of the Forest Plan, indicated that the standard and guidelines of the Forest Plan would protect individual plants populations. It was determined that Alternatives 3-9 may impact individuals if they are in an actively managed stand but would not likely cause a trend towards federal listing (Forest Plan, FEIS, Appendix J).

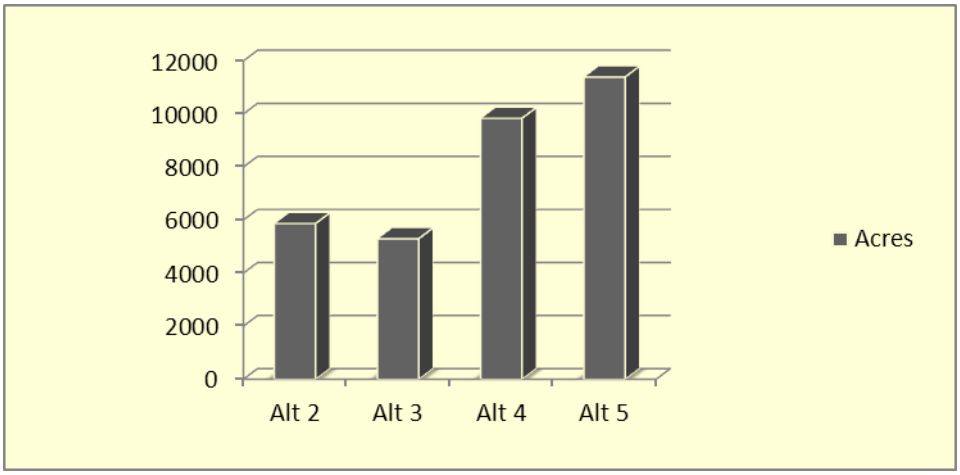
The cumulative effects for this project will determine if the actions from the project are within Forest Plan projections for changes in suitable habitat acres for those rare species in the project area and are within the range of effects analyzed for Forest Plan Alternatives 3-9. If so, the effects of the project are within the range analyzed in the Forest Plan FEIS. If not, a threshold will be crossed and the cumulative effects are beyond those analyzed in the Forest Plan.

Direct/Indirect/Cumulative Impacts

In Alternative 1, no activity would occur within the area in relation to this project. There would in turn be no direct or indirect effect to this species. Without direct or indirect effect, there would be no cumulative effect.

The action alternatives propose varying amounts of harvest utilizing individual tree selection harvest treatments in suited stoloniferous sedge habitat (Figure 7).

Figure 7: Stoloniferous Sedge Suited Habitat Proposed for Management by Alternative.



There are 10 documented occurrences of stoloniferous sedge affecting up to 12 stands in the project area. Depending on the alternative chosen, from 5 to 11 of these sites are in stands proposed for management by various "action" alternatives (Table 17). Alternative 5 (proposed action) would treat the greatest number of stands while alternative three proposes to treat the least.

Table 17: Stands Being Treated with Stoloniferous Sedge Occurrence

	Alt 1	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Occupied Stands Treated	0	9	5	10	11
Total Occupied Stands	12	12	12	12	12

A direct effect would occur if individual plants were trampled by logging machinery or other soil disturbing equipment during harvest operations or if occupied habitat was made unsuited by management. Proposed management for all of the stands with stoloniferous sedge sites is individual tree selection harvest of hardwoods with residual canopy cover remaining above 75 to 80 percent. These stands would remain suited habitat. Sedge populations within stands selected for management would be protected by a 100 foot buffer zone that would preclude all timber harvest or ground disturbing activity reducing the potential for direct impact (Appendix E, Table E5, G178). In addition, the alternatives include measures for winter only harvest, which further lessens the likelihood that an individual or population of this sedge could be directly impacted (Appendix E, Table E5, G386).

An indirect negative effect would include the action making other-wise suited but unoccupied habitat unsuited. Two types of harvest are proposed for stands representing suited but unoccupied habitat for this species. In stands proposed for selection harvest, canopy closure is expected to remain above 75 to 80 percent. This canopy closure should be adequate for maintaining suited habitat in unoccupied stands. One stand of about 19 acres is slated for a shelterwood harvest to regenerate red oak. This harvest would result in this stand no longer representing suited habitat and is proposed for all of the action alternatives. The indirect effect across all action alternatives (Alternative 2-5) would be the loss of about 19 acres of suited but unoccupied stoloniferous sedge habitat.

Cumulative effects are the impacts on the environment that result from the incremental impact of the action when added to past, present, or reasonably foreseeable actions. Within suitable habitat, the effects of individual tree selection harvest treatments in northern hardwood stands that occurred more than five years ago are assumed to be dissipated by now because average canopy closure during such treatments have closed to ≥ 80%. There have been no hardwood timber sales on federal land in suited

habitat within the cumulative effects boundary during the past five years. This project would result in the loss of about 19 acres of suited but unoccupied habitat across all action alternatives.

Beyond this project, there are no anticipated or planned projects that would affect suited stoloniferous sedge habitat within the effects boundary. The cumulative effect for all action alternatives is thus a reduction of suited acres within the project area from about 12,938 to 12,919 acres. This small reduction (about 1/10 of 1 percent) in suited habitat would not trend this species towards federal listing or lessen this species' overall viability.

In summary, impacts to individual plants or plant colonies are not expected in any alternative. More than 99% of the current suitable habitat would remain suitable habitat in all alternatives. Stoloniferous sedge would not trend towards federal listing or lose viability in any alternative. Any impact would be inadvertent, such as trampling of individual undocumented plants that lie outside of buffer areas set up to protect plant populations from direct effect.

Between the alternatives, there is very little difference in regards to potential impact to stoliniferous sedge.

RFSS - American ginseng.

Issue 1

It is thought that the single greatest threat to ginseng is the irresponsible digging of its roots for export. This plant is primarily used in China for medicinal purposes, where wild-grown plants command a substantial price premium over cultivated plants. Another threat is logging of mesic hardwood forests since it requires a shaded moist setting. Ginseng is physiologically adapted to low light levels and can experience early leaf senescence or depressed growth with moderate to high light levels associated with some timber harvest (Anderson et al., 1993).

Affected Environment / Area

Ginseng occurs across eastern North America from Quebec west to Minnesota, south to Oklahoma and Georgia. It is most common across the Appalachian and Ozark mountains. In Wisconsin, it is scattered across the state with approximately 124 sites documented in the Wisconsin State Herbarium as of July, 2010. Throughout this broad range, ginseng occurs primarily in dry-mesic to mesic "rich" woods. In addition, this species typically inhabits landforms that include slopes or ravines, ranging even into swampy portions.

On the CNNF there are 698 documented sites for ginseng. It is found on every district of the Forest except for Washburn and Great Divide with the majority of sites located on the Nicolet side of the Forest. There are six sites located on the Park Falls landbase. One of these sites may no longer exist as repeated efforts to re-locate it over the past decade have yielded no plants.

The following factors are thought to be important in determining suitable habitat for this species.

- Habitat Types (Kotar et al. 2002): ATM (Acer-Tsuga/Maianthemum), AH (Acer/Hydrophyllum), AFVb (Acer-Fagus/Viburnum), AVVb (Acer/Vaccinium-Viburnum), AOCa (Acer/Osmorhiza-Caulophyllum), and ATD (Acer-Tsuga/Dryopteris).
- Populations of ginseng within the Chequamegon-Nicolet National Forest predominantly occur on moderate to rich soils with a canopy cover of 80% or more.
- Forest cover types are predominantly northern hardwoods).
- Known ginseng sites occur typically in stands that are 50 years or older in age and have a stand size density of 6 (poletimber more than 70% stocking) to 9 (sawtimber more than 70% stocking).

Based on these criteria, there are approximately 22,881 acres of suited habitat available on the Park Falls landbase and 13,655 acres of habitat within the project area.

Occupied habitat was defined using information on the species dispersal mechanism, distance and number of individual plants at a single Element Occurrence (EO) site, and Habitat-based Plant EO Delimitation Guidance developed by NatureServe (NatureServe 2008). Given these considerations, occupied habitat can include the stand in which the EO is located and any adjacent stands of suited habitat that have an additional EO within 1 km of each other. If there is a single EO occurrence in a stand

or limited information is available for the EO, then the whole stand will be considered occupied if the number of plants present and suitable habitat justify this inclusion.

Cumulative Impact Boundary

The cumulative impact boundary for this issue is Park Falls Hardwoods project area and includes MAs other than the 2B MA. While there are no harvest activities planned within the 8E, F, and G MAs, plant locations are not dependent on MA boundaries, so all MAs were included as applicable.

Due to limited dispersal distance, populations of this species are not likely to interact between landbases of the CNNF, or even between Ranger Districts. The effects of the project will be contextualized by providing estimates of the proportion of occurrences of RFSS that are within this project area and the Park Falls landbase on land within the Forest Service boundary. When private lands contain portions of a known occurrence in the project area, it is considered in the effects to the degree that we know what's happening on the private land.

Past and Reasonably Foreseeable Actions

Beyond this project, there are no anticipated or planned projects that would affect suited ginseng habitat within the effects boundary.

Measures

The measure for ginseng is the changes in suitable habitat acreage as a result of the proposed actions. Analyses will differentiate between currently occupied habitat (direct effect) and suitable but unoccupied habitat (indirect effect).

Thresholds

In the Species Viability Evaluation (SVE) process for the Forest Plan Revision, no minimum numbers of plants or plant patches or its habitat were identified (USDA Forest Service, 2004). Overall the SVE, which analyzed Alternatives 3-9 of the Forest Plan, indicated that the standard and guidelines of the Forest Plan would protect individual plants populations. It was determined that Alternatives 3-9 may impact individuals if they are in an actively managed stand but would not likely cause a trend towards federal listing (USDA Forest Service 2004).

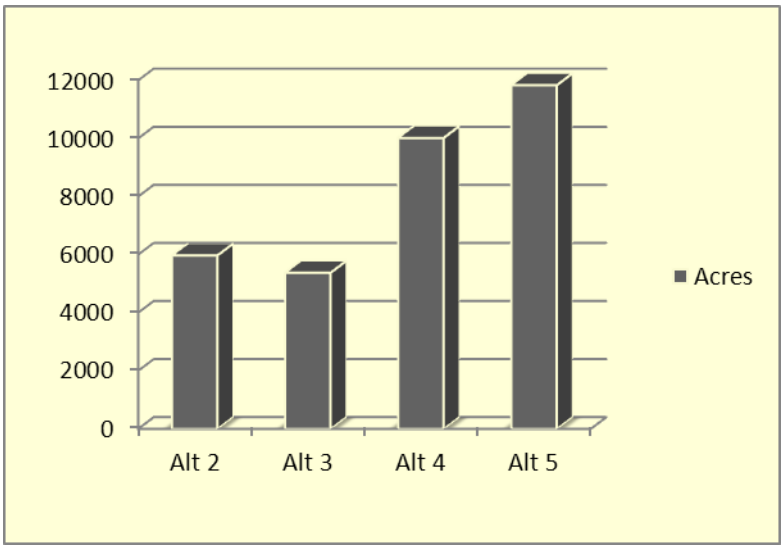
The cumulative effects for this project will determine if the actions from the project are within Forest Plan projections for changes in suitable habitat acres for those rare species in the project area and are within the range of effects analyzed for Forest Plan Alternatives 3-9. If so, the effects of the project are within the range analyzed in the Forest Plan FEIS. If not, a threshold will be crossed and the cumulative effects are beyond those analyzed in the Forest Plan.

Direct/Indirect/Cumulative Impacts

In Alternative 1, no activity would occur within the area in relation to this project. There would in turn be no direct or indirect effect to this species. Without direct or indirect effect, there would be no cumulative effect.

The action alternatives propose varying amounts of harvest utilizing individual tree selection harvest treatments in suited ginseng habitat (Figure 8).

Figure 8: Ginseng Suited Habitat Proposed for Management by Alternative.



Alternatives 2, 4, and 5 propose to manage one stand which contains three documented ginseng populations. Proposed management of this stand in all alternatives is individual tree selection harvest of hardwoods with residual canopy cover remaining above 75 to 80 percent. Ginseng populations would be protected by a 100 foot buffer zone that would preclude all timber harvest or ground disturbing activity and which would persist as an inclusion within this stand (Appendix E, Table E5, G178). There is no anticipated direct effect related to management in any of the alternatives because:

- Populations would be buffered by a 100 foot no management zone.
- Residual canopy cover would remain above a 75% to 80% threshold which is felt to be adequate for this plant.
- Occupied stands would be harvested during times of frozen ground lessening the chance to spread invasive plants or earthworms.

An indirect negative effect would include the action making other-wise suited but unoccupied habitat unsuited. Two types of harvest are proposed for stands representing suited habitat for this species. In stands proposed for selection harvest, canopy closure is expected to remain above 75 to 80 percent. This canopy closure should be adequate for maintaining suited habitat in unoccupied stands. One stand of about 19 acres is slated for a shelterwood harvest to regenerate red oak in all action alternatives. This harvest would result in this stand no longer representing suited habitat. The indirect effect across all action alternatives would be the loss of about 19 acres of suited but unoccupied ginseng habitat.

Cumulative effects are the impacts on the environment that result from the incremental impact of the action when added to past, present, or reasonably foreseeable future actions. Within suitable habitat, the effects of individual tree selection harvest treatments in northern hardwood stands that occurred more than five years ago are assumed to be dissipated by now because average canopy closure during such treatments have closed to ≥ 80%. There have been no hardwood timber sales on federal land in suited habitat within the cumulative effects boundary during the past five years. This project would result in the loss of about 19 acres of suited but unoccupied habitat across all action alternatives.

Beyond this project, there are no anticipated or planned projects that would affect suited ginseng habitat within the effects boundary. The cumulative effect is thus a reduction of suited acres within the project area from about 13,655 to 13,636 acres.

This small reduction (about 1/10 of 1 percent) in suited habitat would not trend this species towards federal listing or lessen this species' overall viability.

In summary, impacts to individual plants or plant colonies are not expected in any alternative. More than 99% of the current suitable habitat would remain suitable habitat in all alternatives. Ginseng would not

trend towards federal listing or lose viability in any alternative. Any impact would be inadvertent, such as trampling of individual undocumented plants that lie outside of buffer areas set up to protect plant populations from direct effect.

Between the alternatives, there is very little difference in regards to potential impact to American ginseng.

Other Plants

Management Indicator Species (MIS) Canada yew.

Issue 1 / Objective 4

There are several factors important to the decline of Canada yew across its range, including anthropogenic disturbance such as past wide-spread timber harvest and associated fire in the late 19th and early 20th century as well as herbivory from white-tailed deer as deer populations grew following the cutover period (Beals et al., 1960; Allison, 1990; Waller and Alverson, 1997; Holmes et al., 2009). Plants that are sensitive to browse become, over time, both smaller and less able to reproduce unless that browse pressure is severely curtailed (Côté et al., 2004). The 2004 Forest Plan EIS identified Canada yew as a species of near viability concern, primarily because of white-tailed deer herbivory (USDA, 2004b, p. 2-55). Forest Plan Goal 1.4, Objective 1.4n speaks to the restoration of Canada yew within northern hardwoods ecosystems where feasible (Forest Plan, page 1-4), and that objective is reflected in the objectives for this project area (restore Canada yew within northern hardwoods ecosystems). For this reason, 1 area of existing Canada yew within the project area has been proposed for supplemental planting and fencing.

Canada yew sites that are within proposed harvest stands but are not proposed for permanent fencing and supplemental planting will receive protection from strategically placed slash remaining from timber harvest activity. Specific to this project, monitoring of Canada yew within fenced areas and where post-harvest slash is piled would measure the effectiveness of fencing versus slash for protection of yew from browse. Height, qualitative robustness, evidence reproduction (flowering or fruiting bodies) and evidence of herbivory will be measured.

Information for Canada yew has been summarized from the Project File (PF), Management Indicator Species (MIS) Report, and supporting files.

Affected Environment / Area

Canada yew is a low growing, evergreen, coniferous shrub found in mixed hardwood hemlock forests, white cedar swamps, and swamp edges in the northeastern United States and southeastern Canada. It is a slow to mature, shade tolerant species that grows best in the stable environmental conditions of climax mixed conifer-hardwood forests. Canada yew ranges from Newfoundland and Labrador west to Manitoba and south to Iowa and Virginia. It was once found nearly throughout Wisconsin; however, it is now extirpated from much of its once state-wide range. Canada yew's conservation status is generally considered globally secure (NatureServe, 2010) and in Wisconsin, the Bureau of Endangered Resources considers Canada yew as a species of special concern.

There are 11 documented sites for Canada yew within the project area totaling about 25-30 individual plants. All of the plants documented within the project area are of small stature, appear heavily browsed, and show no signs of reproduction (flowers, fruits, etc).

The analysis area for direct, indirect and cumulative effects is limited to the MA 2B portion of the project area since that is where the proposals to manage and protect sites of Canada yew are occurring.

Cumulative Impact Boundary

The cumulative impact boundary for this issue / objective is also the MA 2B portion of the project area. While other activities may be happening within MA 2B on other parts of the CNNF, only the actions happening within this project area are relevant to determining if this objective is being met. If the trajectory of Canada yew (populations) is moving towards the desired condition (same or expanding), then there is no need to look outside the project area. Only National Forest System land was considered. Activities on private lands are not subject to Forest Plan or project objectives.

Past and Reasonably Foreseeable Actions

Forest management activities contributing to Canada yew decline have for the most part not taken place within the project area. With the exception of salvage and restoration activities due to natural disturbances, primarily in regards to spruce decline, very little forest management has occurred for over two decades. There are no other reasonably foreseeable (planned) projects being considered for this area that would impact Canada yew habitat or existing plants.

Measures

The measures for Canada yew will be the number of stands with yew treated for enhancement of existing populations, the number of yew sites that would have supplemental planting and fencing, and the number of yew sites that would include slash placement.

Direct/Indirect/Cumulative Impacts

In Alternative 1, there would be no management related to this project that could impact yew plants or habitat. No action would mean no supplemental planting of Canada yew and or slash placement around documented yew populations with harvest units. Because there would be no supplemental planting, there would be no fencing. This would likely result in the extension of the current condition which is that Canada yew would likely continue to exist in the project area but is unlikely to increase.

All action alternatives propose to manage at least some stands that have Canada yew with individual tree selection harvest of northern hardwoods. Selection harvest that maintains a canopy of at least 75 to 80% closure should not directly lead to a decline in Canada yew due to increased light levels, decreased forest floor humidity, etc. as long as canopy gaps are not placed directly over existing populations of yew. Lower canopy cover percentages as well as canopy gaps directly over or adjacent to Canada yew has been shown to be detrimental to yew (Kneeshaw and Prevost, 2007; Holmes et al. 2009). Timber harvest may also directly impact individual yew plants by equipment trampling. Marking of yew locations prior to harvest and designing canopy gaps to not occur directly over populations of Canada yew would mitigate these potential effects (Appendix E, Table E2, 8 Individual Tree Selection Prescription).

Table 18: Canada Yew Occurrence and Treatment by Alternative

	Alt 1	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Occupied Stands Treated	0	5	2	3	6
Occupied Stands with Planting and Fencing	0	0	0	1	1
Occupied Stands with Slash Protection	0	5	2	2	5
Total Occupied Stands	11	11	11	11	11

Alternative 2 proposes placement of post timber harvest slash over and around 5 existing yew sites. No planting or fencing sites would occur in this alternative (Table 18). Alternative 3 proposes placement of post timber harvest slash over and around 2 existing yew sites. No planting or fencing sites would occur. Alternative 4 proposes placement of post timber harvest slash over and around 2 existing yew sites. One planting and fencing site would occur in this alternative. Alternative 5 proposes placement of post timber harvest slash over and around 5 existing yew sites. One planting and fencing site would occur in this alternative.

Project design would negate any potential indirect effect (changes in light intensity, humidity, etc) or direct effect (trampling) from harvest activity in stands with a Canada yew population in all the action alternatives.

All the action alternatives propose the placement of post timber harvest slash over and around existing yew as a deterrent to deer browse. Some studies that have looked at post-harvest slash as a deterrent to browse by ungulates have demonstrated that high levels of downed woody debris hinder the ability of deer to reach or locate preferred herbs and woody seedlings (Tilghman, 1989; Krueger and Peterson, 2009). Other studies refute the protective effect of slash, finding no or little difference in target species within areas of high slash and no or low slash amounts (Fredericksen et al., 1998; Pellerin et al., 2010).

None of these studies specifically looked at Canada yew and the effect of slash in inhibiting browse in regards to yew. Currently it is unknown as to whether or not slash would be an effective deterrent.

In summary, Alternatives 1, 2, 3, 4, and 5 would have no negative direct or indirect effect. Planting and subsequent fencing of planted yew would be a direct positive effect in Alternatives 4 and 5. Cumulatively, recent past management has had little or no effect on Canada yew in the project area. When combined with this project, any cumulative effect would be positive, primarily because yew numbers would increase through planting and fencing in Alternatives 4 and 5. In Alternatives 1, 2, and 3 Canada yew would likely continue to exist in the project area at very low numbers. Unfenced yew would likely remain in a browsed state and would not reproduce. Logging slash as a barrier will be monitored to evaluate its effectiveness at affording Canada yew protection from browse.

Wildlife

In 2011, a review of the RFSS list was conducted and several species that were analyzed for this project are no longer considered to be potentially trending to federal listing and have been removed from the RFSS list (USDA Forest Service 2011). Other species were added to the RFSS list. For this DEIS and the supporting biological evaluations and addendums, any species that was added to the list was analyzed and the biological evaluations for this project were updated.

Species removed from the RFSS list still appear in this document as RFSS. Regardless of their status as an RFSS, Forest Plan standards and guidelines would still apply as indicated in Appendix F. Animals no longer listed as RFSS include northern goshawk, Swainson's thrush, black tern, trumpeter swan and tawny crescent. Northern goshawk is addressed below. See Appendix C for information on the other 5 animal species removed from the list.

Animals added as RFSS include several bat species due to the devastation of hibernating bat populations from disease (white-nosed syndrome). RFSS Bats are discussed in this Chapter. Timber wolf was recently removed from federal listing as a threatened or endangered species (TE). As such, it has been added to the RFSS list, but is still listed as a TE species in this document. See Appendix C.

RFSS - Northern goshawk.

Issue 2

Timber harvest and associated activities have the potential to disrupt breeding, disrupt nesting success, impact suitable habitat for nesting, foraging, and prey availability. Information for this analysis has been summarized from the Project File (PF), Draft Biological Evaluation, Park Falls Hardwoods DEIS, June 2011 and supporting files associated with northern goshawk.

Affected Environment / Area

The northern goshawk is a large, forest-dwelling raptor generally associated with mature deciduous, conifer, or mixed forest (Boal et al., 2001 and 2003). These forest types of southern Ontario and the northern portions of Michigan, Minnesota, and Wisconsin are the southernmost extent of its current breeding range (Kennedy and Anderson, 2001). Recent habitat modeling using a Geographical Information System (GIS), predicted that only 7.6% of the northern highland landscape of Wisconsin had >50% probability of being occupied by breeding goshawks (Woodford et al. 2003). Some additional new information that helps provide a large-scale picture of goshawk is the final report for the Bioregional Monitoring for Northern Goshawks in the Western Great Lakes (Bruggeman et al. 2009). The report documents the process used in 2008 to sample randomly located Primary Sampling Units (PSUs) in Minnesota, Wisconsin, and Michigan for goshawk activity. Each PSU is 600 ha (1,483 acres) and was designed to approximate the size of one goshawk territory based on existing data. Based on the survey, an estimate was made of 5,184 ± 199 PSUs with goshawk occupancy throughout the 3-state survey area. The report also estimated a total of 442 ± 244 PSUs with goshawk occupancy in the Chequamegon-Nicolet National Forest (Bruggeman et al. 2009, p. 23).

Currently, the goshawk is an uncommon resident in the north and an uncommon migrant in the central and southern parts of the state. However, increased numbers of goshawks may occur approximately every 8-10 years when ruffed grouse and snowshoe hare populations are low in the bird's northern range

(Robbins, 1991). The Wisconsin Breeding Bird Atlas confirmed goshawk nesting in 22 counties, primarily north of a line from Door to Menominee to Taylor to Douglas counties. A few nests were located south of this area (Cutright et al, 2006).

The goshawk is morphologically well adapted for life in forested lands and is considered a habitat generalist as it occupies most of the forested types in its range. Specific nesting habitat information is limited for eastern populations due to a lack of studies that examine nest site placement in the context of available habitat features. A summary of western data indicated that goshawks tend to select stands with relatively large trees and high canopy closure (Kennedy and Anderson, 2001). Nest trees noted by Wisconsin Breeding Bird Atlas workers included red pine, white pine, aspen, paper birch and yellow birch (Cutright et al. 2006). A number of studies indicate that nests may be located near natural or man-made openings in the overstory as they provide travel corridors, reduce flight barriers for fledglings, and increase prey diversity (PVA - Population Viability Assessment, 2000). Goshawks are active and opportunistic hunters that take large prey, including snowshoe hares, ruffed grouse, larger songbirds, squirrels, and other species that occupy the ground-shrub zone (PVA, 2000). Snags, downed logs, openings, large trees, shrubby understories, and interspersion of vegetation structural stages (grasses to old forests) are important habitat features for prey species used by the goshawk. The proposed activities could impact the amount of northern goshawk nesting habitat available and the amount of habitat for preferred prey species.

In general, timber harvest management can have adverse consequences on goshawk nesting territories (abandonment of the nest). The greatest impact could occur from harvesting all of a stand containing the nest. There could also be impacts if any activities within the territory occurred during the nesting or brood-rearing season of mid-February to early August. Excess disturbance can cause birds to leave their nests long enough for eggs or young to be susceptible to exposure to cold, wet weather or predation. Also, timber harvest within the bird's territory that changes the quality of the nesting habitat could have the similar negative results. The birds may avoid nesting because of these disturbances within an otherwise suitable nesting area. Timber harvesting, while potentially adverse when in close proximity to a nest, can have a positive impact by creating habitat for prey species such as ruffed grouse and snowshoe hare (in the case of aspen clearcutting) or encouraging bigger diameter trees for nesting over the long run (in the case of hardwood selection harvesting).

As stated above, goshawk forage on a variety of prey species (snowshoe hare, ruffed grouse, larger songbirds, squirrels, and other species that occupy the ground-shrub zone (PVA, 2000). Small mammals such as voles, mice, and chipmunks are part of the prey species that occupy the ground-shrub zone. Many of these species utilize early successional habitat such as aspen clearcuts, openings, lowland brush (alder), and scattered edge habitat, along with fine woody debris (tree tops <4" in diameter) in all areas (mature to early-successional). Fine woody debris (FWD) provides habitat for many of these goshawk prey species by providing forage and cover. While there are few studies on the impacts of biomass (FWD) removal on the trends and responses of these species, those studies evaluated suggest that FWD retention is beneficial to small mammals and prey for many other species such as insects (WDNR Herrick et al 2008). The effects of biomass harvest on wildlife species is discussed in more detail later in this chapter in the General wildlife – Coarse and fine woody debris section. While biomass harvest is not required in this project, it may occur which could lead to changed conditions for some goshawk prey species (such as mice).

Project specific surveys were conducted in the Park Falls Hardwoods project area during spring and early summer 2007. A total of approximately 12,800 acres were surveyed for hawks. Surveys were conducted by playing con-specific calls for northern goshawk and/or red-shouldered hawk at points every 200 meters along transects 200 meters apart. Surveying was only conducted in suitable weather conditions (winds less than 12 mph and little to no precipitation) and by visual surveys and playing con-specific calls for northern goshawk and/or red-shouldered hawk at points every 200 meters along transects 200 meters apart. All proposed harvest stands that are suitable habitat were surveyed and additionally any suitable habitat within 1,000 feet of any proposed harvest stand. The 1,000 feet distance comes from the radius of the Forest Plan combined buffers for goshawk (Forest Plan, p. 2-20, 2-21). The stands that had possible signs of hawk activity during the surveys (old large nest, possible answer to the broadcast caller) have been resurveyed yearly. There are 6 groups of possible goshawk nests being monitored yearly since 2007 with no new hawk activity documented. An additional 5,800 acres of surveys were conducted

in the spring of 2011. Based on surveys, there was one new goshawk nest located in the Park Falls Hardwoods analysis area bringing the total of known active goshawk territories to three, out of 9 total known or potential territories monitored.

Multiple spatial scales were used to evaluate meaningful effects to goshawk. For evaluating direct and indirect effects to the species, the project area was used. Any goshawks nesting or foraging within the project area have the potential to be directly (destruction of nest tree) or indirectly (loss of habitat) affected by the proposed activities.

Cumulative Impact Boundary

Cumulative effects to goshawk are analyzed at the scale of the project area, the Medford-Park Falls District and the Chequamegon landbase (not the entire CNNF). This analysis area is appropriate because: In over two decades of study of goshawks in northern Wisconsin by Tom Erdman and others, no birds have been recorded to move between the Forest's Chequamegon and Nicolet landbases and dispersal between these two areas is extremely unlikely based on recorded movements and nesting sites of banded individuals. No bird band or other dispersal information exists that compels an analysis area that is so large as to include both the landbases of the CNNF, and in fact, there is information to indicate that there is no northern goshawk interaction between the Chequamegon and Nicolet landbases (Erdman personal communication 4-27-2006).

The temporal scale of the cumulative effects analysis includes past actions and those that are reasonably foreseeable. Actions within the last five years may not have been incorporated into the Forest Service vegetation database and were tracked separately from older past actions, the effects of which are assumed to be manifested in current conditions (as represented in the vegetation database). Beyond five years, the effects to goshawk are undetectable in northern hardwood forest because within five years canopy gaps created during thinning or improvement cuts have closed such that canopy closure at the stand meets or exceeds 80 percent. Activities such as clearcut harvest have longer lasting effects because they take habitat that may be (or may have been) suitable to goshawk and make it unsuitable for approximately 50 years. Essentially, the effects of treatments in the past are manifest in the records and projections of suitable goshawk habitat. These actions would be considered for each of the geographic areas described above.

Past and Reasonably Foreseeable Actions

Cumulative impact analysis includes consideration of past, present and reasonably foreseeable future actions as relevant to the issue. Forest projects considered in the cumulative impacts for this project are listed in Table 19. These are the recent decisions and reasonably foreseeable projects on the Chequamegon landbase that have the potential for impacts to goshawk.

Table 19: List of Forest Vegetation Management Projects (Past and Reasonably Foreseeable) used for Impacts to Goshawk

Project Name	***District***
Cayuga	Great Divide
Twentymile	Great Divide
Great Divide Red Pine Thin	Great Divide
Twin Ghost	Great Divide
Camp Four	Medford-Park Falls
Medford Aspen	Medford-Park Falls
Hoffman Sailor West	Medford-Park Falls
2009 Medford Spruce Thin	Medford-Park Falls
Riley Wildlife Management Area	Medford-Park Falls
Park Falls Hardwood	Medford-Park Falls
Fishbone	Washburn
NW Sands	Washburn
Washburn Red Pine Thinning	Washburn
Early Successional Habitat Improvement	Multiple Districts

Non-Forest Service lands were analyzed inside the project area boundary and within a 1 mile buffer outside the project area. The 1 mile distance exceeds the distance northern goshawk are known to relocate following abandonment or disuse of a previously occupied nest site (Bosakowski 1999). This provides context for the relative availability of habitat on adjacent and other ownership lands and CNNF lands. There are approximately 3,339 acres of non-forest service lands within the Park Falls Hardwoods project area boundary, and an additional 20,752 acres outside of the project area boundary, and predominately outside of the District Boundary (Table 20). These non-forest service lands are owned by private individuals, industrial groups or the state of Wisconsin. Habitat determination of these lands was completed by interpreting 2005 National Agriculture Imagery Program (NAIP) aerial photos. NAIP aerial photos were used rather than WISCLAND data because the NAIP information is much newer and has better resolution at a finer scale.

Private lands within the project area consist of approximately 1,240 aces managed by the State of Wisconsin Board of Commissioners for Public Trust Lands. Approximately ½ of this area is lowland bog and swamp conifer while ½ is mature northern hardwoods, with the hardwoods managed with uneven-aged silvicultural techniques for profit and long-term fiber production. With the utilization of uneven-aged management for these hardwood stands, for the purpose of this analysis it will be assumed that the stand will retain 80% canopy cover following harvest (Welch 3-11-10 email).

Lands within a 1 mile buffer of the project area, largely outside of the Forest boundary, are a mix of Price County, Oneida County, private industrial, private, and State of Wisconsin Public Trust Lands ownerships. According to discussions with the adjacent landowners (Welch 3-11-10 email) there are approximately 3,800 total acres of Price County lands within this one-mile buffer, with upland acres consisting of aspen and mixed aspen forest types managed even-age at 40 year rotations. Oneida County owns approximately 4,200 acres within the 1 mile buffer with 2/3 of the upland acres aspen or mixed aspen forest managed even-aged on a 45 year rotation and the remaining 1/3 comprised of hardwoods managed uneven-aged. Private industrial forest own approximately 4,700 acres, of which 2/3 is aspen managed on a 40 year rotation, 1/6 is uneven aged hardwood management, and 1/6 is in conifer plantations. The State of Wisconsin Board of Commissioners for Public Trust Lands owns another 3,500 acres of intermixed parcels. These parcels are ¾ swamp lands. Of the remaining ¼ acres in uplands, 2/3 of these are in aspen managed in a 65 year rotation and 1/3 are hardwoods managed with uneven age silviculture. The remaining private lands are smaller in size with scattered individual private ownership.

Table 20: Forest Cover Type Composition in Acres of the Non-federal Lands (including land within the Park Falls Hardwoods project area and within 1 mile of the project area boundary).

COVER TYPE	TOTAL ACRES	%
Agriculture	162	0.7
Aspen	7,089	29.4
Clearcut	821	3.4
Lowland Conifer	3,625	15.0
Lowland Hardwoods	1,109	4.6
Lowland Openings	5,485	22.9
Oak	0	0
Pine	231	1.0
Spruce/Fir	348	1.4
Upland Hardwoods	4,830	20.0
Upland Openings	76	0.3
Urban	279	1.2
Water	36	0.1
TOTAL	**24,091**	**100.0**

Comprehensive data on these private lands including age structure within each forest type category, specific management history, and future management plans are not available. Therefore the following assumptions are made:

The age structure of the forested lands is similar to the age structure of the same forest types on the CNNF.
All private forested lands are enrolled within Wisconsin's Managed Forest Law (MFL) program.
Adjacent and other ownership lands that are classified as northern hardwoods are treated on a 15-year entry cycle with uneven-aged silviculture prescriptions that retain 80% canopy cover.
Aspen stands are clearcut and regenerated when they are approximately 40-45 years of age, with the exception of approximately 570 acres of aspen on State of Wisconsin Public Trust Lands that would be clearcut on 65 year rotations (Welch 3-11-10 email).
Lowland conifer or lowland hardwoods are managed if on productive sites (site indices > 35 or 45) by strip clearcut harvest with a rotation of 80-150 years depending on the site index (Welch 3-12-10 email)
No forest cover type changes will occur (aspen is managed to remain aspen, etc).

Measures

Measures for estimating impacts to northern goshawk include nesting territories impacted, the amount of available nesting habitat, and estimates of goshawk prey habitat available.

In the effects analysis for goshawk, suitable habitat is defined as northern hardwoods, hardwoods with hemlock, and aspen (USDA 2009b). All of the above types must be 50+ years old to be considered suitable for goshawk because that age is approximately when the forest is expected to have a closed canopy and some trees are large enough to be used for nesting. Aspen types must be ages 50-65. Any hardwood habitat could be 50+ years old or typed as an uneven-aged stand. Individual tree selection harvesting will have a short-term (5 year) negative effect on goshawk nesting habitat in those pole-sized hardwood stands with an average stand diameter of 9 inches or less. This is because the canopy closure after the cut would drop below 80% for approximately 5 years. Those hardwood stands with more sawtimber present (average stand diameter of 10 inches or more) will also be harvested with individual tree selection silviculture method, but the end result will maintain 80% canopy closure following harvest and thus no effect on goshawk nesting habitat. Stands managed using even-aged silvicultural methods (clearcutting, overstory removal) are assumed to be unsuitable nesting habitat for a period of approximately 50 years following a treatment. However, this early successional habitat is ideal for supporting higher densities of grouse and hare populations that are preferred goshawk prey.

Nest protection zones are from the Forest Plan (pages 2-20 & 2-21) and total approximately 68 acres with both buffers. Based on comments received on the proposed action, Alternative 3 was developed with an increase in the nest or territory area (see Chapter 2, Alternative 3).

Thresholds

In the species viability evaluation (SVE) process for the Forest Plan revision (Schenck et al., 2004), no minimum numbers of goshawk or its habitat were identified. However, Forest Plan FEIS, Alternatives 3-9 and the Selected Alternative were judged to result in beneficial effects to goshawk (Forest Plan FEIS Appendix J, p. J-68) as a result of standards and guidelines protecting the species and the projected increase in northern hardwood forest types (see Forest Plan FEIS, Fig 3-13). The cumulative effects analysis for this project will determine if the trajectory of the Forest's acres of suitable goshawk habitat is within the range of the Plan Alternatives 3-9, which is an increase of between 0.26 percent and 0.51 percent in the amount of upland hardwood habitat after 10 years of revised Plan implementation. If so, effects are within the range analyzed in the Plan Revision process and accepted with the adoption of the 2004 Forest Plan. If not, then the project contributes to moving the forest outside what was anticipated for goshawk nesting habitat and the cumulative effects are beyond those analyzed in the Forest Plan revision process and management direction in goshawk habitat will be reevaluated.

While not a threshold, suitable nesting habitat for northern goshawk will also be evaluated based on the Forest process paper: Habitat Models for Effects Analysis; Animal RFSS (USDA 2009b) in addition to the threshold discussed above. This model includes older age aspen as suitable nesting habitat, along with the northern hardwoods analyzed in the Forest Plan.

Direct/Indirect/Cumulative Impacts

In Alternative 1, no actions would occur. No harvesting, road building, or biomass harvest would take place in this alternative so there would be no impact to any suspected or known goshawk territories.

There would be no impact to current suitable habitat. There are changes that would happen through natural forest succession and processes, so the no action impacts (Alternative 1) are discussed below as a comparison to the action alternatives.

There will be no direct impacts to goshawk nests or territories in Alternatives 1-5. In Alternative 1, there are no activities occurring, therefore no impacts. In Alternatives 2-5, impacts to nesting sites do not occur because direct and indirect disturbance to nests are avoided (Appendix E, Table E5, G178, G185-G187, M187, and G188-G189) by preventing activities from occurring near nests or at times when the nests could be active. These measures apply to 3 active nesting sites as well as 6 other "probable" nesting sites.

Suitable nesting habitat is a key factor for the continued existence of goshawk across the landscape, as pointed out in the Forest Plan. Additionally it provides areas for dispersing young to set up territories when reaching suitable age and begin nesting, and as habitat for existing territories to move, as is common for this species.

Table 21: Goshawk Nesting Habitat by Alternative (Cumulative)

Park Falls Hardwoods Project Area	***Alt 1***	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Currently	18,676	18,676	18,676	18,676	18,676
Immediately following treatment	18,896 +220 ac +1.2%	18,877 +201 ac +1.1%	14,757 -3,919 ac -21.0%	12,085 -6,591 ac -35.3%	11,067 -7,609 ac -40.7%
Five years after treatment	19,238 +562 ac +3.0%	19,238 +562 ac +3.0%	18,985 +309 ac +1.7%	18,995 +319 ac +1.7%	18,985 +309 ac +1.7%
Medford-Park Falls District	***Alt 1***	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Currently	96,810	96,810	96,810	96,810	96,810
Immediately following treatment	96,031 -779 ac -0.8%	96,012 -798 ac -0.8%	91,892 -4,918 ac -5.1%	89,220 -7,590 ac -7.8%	88,202 -8,608 ac -8.9%
Five years after treatment	97,034 +224 ac +0.2%	97,015 +205 ac +0.2%	96,763 -47 ac -0.05%	96,773 -37 ac -0.04%	96,763 -47 ac -0.05%
Chequamegon Landbase	***Alt 1***	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Currently	249,638	249,638	249,638	249,638	249,638
Immediately following treatment	245,277 -4,361 ac -1.7%	245,258 -4,380 ac -1.8%	241,138 -8,500 ac -3.4%	238,466 -11,172ac -4.5%	237,448 -12,190ac -4.9%
Five years after treatment	246,125 -3,513 ac -1.4%	246,106 -3,532 ac -1.4%	245,854 -3,784 -1.5%	245,864 -3,774 ac -1.5%	245,854 -3,784 -1.5%

Table 21 shows the expected direct, indirect, and cumulative impacts to goshawk suitable nesting habitat at various spatial and temporal scales. At the project level scale, there are impacts to suitable nesting habitat for goshawk in Alternatives 1-5. Currently there are 18,676 acres of suitable nesting habitat for goshawk within the Park Falls Hardwoods project area. There would be a reduction in suitable habitat immediately after harvest treatments in Alternatives 3-5 primarily due to reducing canopy closure below 80% in some of the northern hardwood stands. This short term reduction in habitat does not occur in Alternatives 1 and 2. After 5 years, it is assumed that the canopy will grow and increase to 80% canopy closure, after which there are no lasting impacts within the hardwood stands. The hardwood treatments causing a short term loss with reduced canopy cover will overall provide for increased tree diversity, structural diversity, and larger tree size which will improve suitable habitat for raptors over time. There is also a small amount of suitable nesting habitat that will be lost long-term, primarily due to clearcutting of aspen stands. There are also acres of aspen becoming habitat when they reach 50 years of age, and

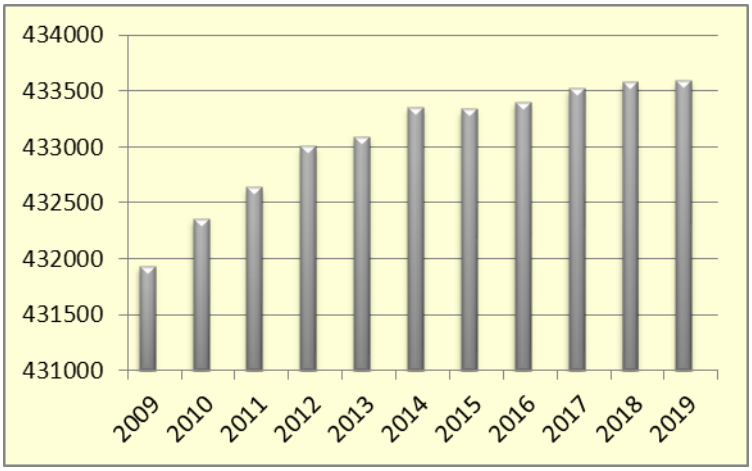
conversely aspen moving out of the suitable nesting habitat category when it reaches age 66. Note that the loss of older age aspen habitat will occur regardless of if the aspen is harvested or not and will occur from now through the next 20 years or so depending on various factors (site condition, weather, disease, insect outbreaks, etc). At the project level scale, all alternatives cumulatively show a small increase (about 2-3%) in goshawk nesting habitat within 5 years of implementation (Table 21).

Across the Medford-Park Falls District, there will be a very slight decrease in suitable nesting habitat within 5 years for Alternatives 3, 4, and 5 (less than 1/10 of a percent), with a slight increase (2/10 of a percent) in habitat for Alternatives 1 and 2 (Table 21). There would be over 96,700 acres of suitable nesting habitat available for goshawk in all alternatives within 5 years of implementation at this scale.

The amount of suitable nesting habitat across the Chequamegon landbase decreases in all alternatives. Alternatives 1 and 2 show a potential decrease of about 1.4 % and Alternatives 3, 4, and 5 show a potential decrease of about 1.5% after 5 years.

It should be noted that these decreases in goshawk nesting habitat at the District and Chequamegon landbase levels are not a result of any alternative in the Park Falls Hardwoods project because there is an overall slight increase in suitable habitat at the project level (2-3%) within 5 years. This slight decrease on the Chequamegon landbase scale is attributed to "outgrowth" of aspen as suitable habitat for goshawk. Aspen that ages past 65 years old becomes unsuitable for goshawk nesting habitat. The amount of 50+ year old hardwoods (primary nesting habitat) on the Forest are on a steady upward trend as indicated by Figure 9.

Figure 9: Forestwide Hardwood Nesting Habitat (for goshawk) – Acres by Year



Aspen clearcutting or other treatments that regenerate aspen provide habitat for two key prey species, ruffed grouse and snowshoe hare (large prey and highly utilized by goshawk). Table 22 shows the amount of this habitat that would be created by the actions in each alternative within the project area. This habitat would help maintain or increase prey species such as ruffed grouse and snowshoe hare. Alternative 1 does not provide this habitat. The young aspen provided in Alternatives 2-5 is a relatively short term impact because this type of habitat only lasts for about 10 years.

Table 22: Aspen Age Class by Alternative (in 5 years)

	Alt 1	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Aspen Regeneration (acres)	0	180	369	466	369

Even so, cumulatively in all the alternatives, other areas of early successional habitat would be available to goshawk prey species through existing aspen clearcuts, openings, lowland brush (alder), and other scattered edge habitat. In addition, there are more than 7000 acres of aspen within and within 1 mile of the project area on other ownerships that are managed on a rotating basis which would provide young

aspen habitat for ruffed grouse and snowshoe hare. Based on this, there would still be some level of these prey species in the project area in Alternative 1 and in Alternatives 2-5. In areas or in alternatives that provide less habitat for grouse and hare, goshawks would likely focus on other prey items such as red squirrels, robins, blue jays, and small mammals that are anticipated to be available under all the alternatives. For additional information on aspen maintenance and age class distribution and wildlife habitat for early successional species, see the vegetation section of this Chapter and the Project Files (PF): Forest Vegetation Resource Report, Management Indicator Habitats report, and the Wildlife Specialist Report.

Biomass (the deposit of coarse or fine woody debris) also plays a role in providing forage and cover for goshawk prey species. Alternative 1 does not deposit coarse or fine woody debris to the forest floor through timber harvest operations. In the short term the amount of coarse and fine woody debris on the forest floor in Alternative 1 is not anticipated to change from the current accrual rate. Woody debris would be available for deposition at a natural interval from wind, or other disturbance events as the stands age and move toward break up. Biomass harvesting is allowed in all action alternatives: In Alternative 2 up to 854 acres, in Alternative 3 up to 1,045 acres, in Alternative 4 up to 1,217 acres, and in Alternative 5 up to 16,984 acres. Alternative 5 is the only alternative that would allow biomass removal in hardwood stands (tipwood removal only). Tipwood biomass harvesting is removal of the main stem from 4" diameter inside bark to approximately 1" inside bark, with all peripheral limbs remaining at the stump site. This tipwood biomass harvesting would remove approximately 1.7 tons/acre of material and leave approximately 8.6 tons/acre. However, the bulk of the remaining biomass is smaller than 1 inch diameter and will not provide the same structure for wildlife (goshawk prey species) as the 1-4 inch diameter tipwood remaining in the hardwood stands in Alternatives 2-4. This small material may decompose faster and some additional woody debris would be crushed during harvest operations. Winter harvest only in the hardwood stands may lessen this impact. Existing structural features such as large downed logs, cavity trees and snags would be retained in treated stands in all action alternatives and would remain in Alternative 1. Since there is little published or unpublished information on the impacts of tipwood or biomass harvest on wildlife species in the upper Great Lakes region northern hardwood habitats or on how this material is utilized by goshawk prey species, there is the potential for an impact on some of the prey species of northern goshawk, particularly in Alternative 5. For additional information on biomass harvest and potential wildlife impacts, see General wildlife – Coarse and fine woody debris section of this Chapter and the Project File (PF): Wildlife Specialist Report.

In summary, there is no impact to goshawk in Alternative 1.

In Alternative 2 there is no impact to goshawk due to the overall increase in nesting habitat at the project level in the short term and long term. Across the Medford-Park Falls Ranger District, no activities are proposed to occur in any possible goshawk nest sites (territories) for the reasonably foreseeable future and there is a small amount of biomass removal. The threshold of effects would not be reached because there would be no reduction in the amount of northern hardwood habitat available in the project area.

In Alternatives 3, 4, and 5, there could be some impact to individual goshawks, but there is likely no trend to federal listing or loss of viability. The threshold of effects would not be reached because there would be no reduction in the amount of northern hardwood habitat available in the project area. Across the District, no activities are proposed to occur in any possible goshawk nest sites (territories) for the reasonably foreseeable future. At the project area scale, habitat for goshawk is expected to increase under all of the Park Falls Hardwoods alternatives in the long term by 1.7%, with a significant decrease in suitable habitat over the short term (20-40%). At the District and Chequamegon landbase level there is a very slight overall decrease in suitable habitat for all alternatives due to aging of aspen past 65 years. Biomass harvest could occur in all alternatives, with the greatest impact in Alternative 5 with up to 16,000 acres of biomass harvest of approximately 1.7 tons/acre. This determination is based upon professional judgment, and specifically the high amount of short term loss of suitable nesting habitat for goshawk within the Park Falls Hardwoods project area. There are no firm amounts in the research as to how much suitable habitat can be lost in an area before affecting individuals or a local population. It is generally assumed that losing a high percentage of a species' suitable habitat in one area could very well impact local cohorts of a population or individuals. Suitable nesting habitat is important for maintaining the species over the landscape and over time (dispersal area for young or relocation of existing nests).

Additionally considered is potential biomass removal across all alternatives and the relatively unknown impact to goshawk prey populations as a result.

RFSS - Red-shouldered hawk (habitat only).

Issue 2

Timber harvest and associated activities have the potential to disrupt breeding, disrupt nesting success, impact suitable habitat for nesting, foraging, and prey availability.

The majority of active and known red-shouldered hawk nests occur on the southeast portion of the CNNF (Lakewood-Laona District). They are locally common in prime habitat on the Medford landbase of the Medford-Park Falls District, but widespread and uncommon on the northern portions of the CNNF. The Park Falls landbase has not had a confirmed red-shouldered hawk nest in 20-30 years despite thousands of acres of intense pre-project surveys and road surveys across the landbase. For this reason, potential nest site impacts are not discussed further in this Chapter.

Information for this analysis has been summarized from the Project File (PF), Draft Biological Evaluation, Park Falls Hardwoods DEIS, June 2011, and supporting files associated with red-shouldered hawk.

Affected Environment / Area

The red-shouldered hawk is a medium to large woodland hawk that is widespread in eastern United States, southeastern Canada, California and Mexico. Prior to 1900 it was one of the most common hawks in eastern US. Presently red-shouldered hawk populations are scattered throughout the north-central states, with a few local areas where they are relatively common (Jacobs and Jacobs, 2002). Wisconsin Breeding Bird Atlas information supports this, with 80% of the counties in Wisconsin reporting red-shouldered hawks, but with low frequency of 10% of priority blocks and only 14% of the quads (Cutright et al., 2006). According to Robbins (1991; p. 213), the red-shouldered hawk was probably never common in Wisconsin but was most abundant in mature bottomland forests along major rivers such as the St. Croix, Wisconsin, Chippewa and Wolf. Other mature hardwood forests, particularly those adjacent to lakes and streams, provided suitable habitat for the species but these areas were heavily logged during the lumbering era that ended around 1930. There are accounts of successful nesting of red-shouldered hawk's since that time and nest productivity has been monitored on the Nicolet landbase since the 1970s by Tom Erdman (UWGB), John Jacobs (Green Bay), the WDNR and others.

Nesting data for red-shouldered hawk's on the Nicolet landbase indicates that populations could be declining, however when J. Jacobs compared his nesting survey results from previous years, it suggested that the birds may have a stable population with low reproduction and low mortality rates (J. Jacobs, 2006). Nests on the Chequamegon landbase have not been monitored to the degree of those on the Nicolet landbase. However, starting in the late 1990's a pro-active road survey for red-shouldered hawks was initiated on the Medford/Park Falls Ranger District and continues annually. The majority of active and known nests occur on the southeast portion of the CNNF (Lakewood-Laona District). They are locally common in prime habitat on the Medford landbase of the Medford-Park Falls District, but widespread and uncommon on the northern portions of the CNNF. The Park Falls landbase has not had a confirmed red-shouldered hawk nest in 20-30 years despite thousands of acres of intense pre-project surveys and road surveys across the landbase.

Preferred habitat for red-shouldered hawks is mature hardwood forest, especially those found in riparian areas, wet or moist forest and upland forest adjacent to ponds, wetlands or swamps. Water is also a critical element because these wet areas are used as foraging sites. Primary food items can vary from area to area or year-to-year but common species are frogs, toads, small mammals, and birds. Home range sizes are dependent on the availability of nesting and foraging habitat. The habitat suitability requirements for red-shouldered hawks are similar to northern goshawk. Due to these similarities, the rationale and protocol used in the goshawk GIS habitat analysis was used for red-shouldered hawk. The differences that do occur are the presence of water near or within the stands and infrequent use of aspen stands for nesting habitat. Red-shouldered hawks utilize wetland forest mainly for feeding on several species of amphibians and reptiles (Woodford et al, 2008). On the Medford-Park Falls District, as it is across the CNNF, there is an extensive amount of water and wetlands available for red-shouldered hawks.

In general, timber harvest management can have adverse consequences on nesting territories (abandonment of the nest). This is unlikely in the project area due to multiple surveys for red-shouldered hawk nests with no results. Harvest activities could also impact the amount of habitat available for dispersal of red-shouldered hawks to new areas. An emerging issue is the potential impact to red-shouldered hawk prey population habitat with biomass removal. The concern is that the removal of woody debris left on the forest floor could reduce the amount of small mammal, reptile (snake), and amphibian habitat in red-shouldered hawk foraging areas. While biomass harvest is not required in this project, it may occur which could lead to changed conditions for some red-shouldered hawk prey species (such as snakes). The effects of biomass harvest on wildlife species is discussed in more detail later in this chapter in the General wildlife – Coarse and fine woody debris section.

Starting in the late 1990's, a pro-active road survey for red-shouldered hawks was initiated on the Medford/Park Falls District. The road surveys are conducted by playing a con-specific call for approximately 7 minutes, every ½ mile along good drivable roads on the District. There are a total of 364 road survey points on the Park Falls landbase, with 108 points occurring within the Park Falls Hardwoods project area (points on the project boundary were counted). No responses have been recorded on the Park Falls landbase, despite conducting 782 point surveys from 2001-2010. There have been 323 points surveyed (108 total points) in 2001, 2002, and 2006. No red-shouldered nests or territories have been located on the Park Falls landbase since the 1980's. Project specific surveys were conducted in the Park Falls Hardwoods project area during spring and early summer 2007 and 2011, in addition to the above on-going proactive road surveys. A total of approximately 12,800 acres were surveyed for hawks in 2007 and 5,800 acres in 2011. Surveys were conducted for red-shouldered hawk in suitable habitat within harvest stands and within an adjacent 1,000 feet of any proposed harvest stand, if adjacent habitat was present. This is the distance of the buffer zone implemented around any known nest sites, per the 2004 Forest Plan (p. 2-20 to 2-21). Suitable habitat is any hardwood stand over 50 years old. Lowland hardwood stands were not surveyed. The stands that had possible signs of hawk activity during the surveys (old large nest, possible answer to the broadcast caller) have been resurveyed yearly. Two areas had a red-shouldered response, but follow-ups to these vocalizations did not locate any nests or any further vocalizations or sightings.

Multiple spatial scales were used to evaluate meaningful effects to red-shouldered hawk. For evaluating direct and indirect effects to the species, the project area was used.

Cumulative Impact Boundary

Cumulative effects to red-shouldered hawk are analyzed at the scale of the project area, the Medford-Park Falls District and the Chequamegon landbase (not the entire CNNF). This analysis area is appropriate because there is no information that exists that compels an analysis area that is so large as to include both the landbases of the CNNF, and in fact there is information to indicate that there is no red-shouldered hawk interaction between the Chequamegon and Nicolet landbases (Jacobs personal communication 10-31-2006).

The temporal scale of the cumulative effects analysis includes past actions and those that are reasonably foreseeable. Actions within the last five years may not have been incorporated into the Forest Service vegetation database and were tracked separately from older past actions, the effects of which are assumed to be manifested in current conditions (as represented in the vegetation database). Beyond five years, the effects to red-shouldered hawk are undetectable in northern hardwood forest because within five years canopy gaps created during thinning or improvement cuts have closed such that canopy closure at the stand meets or exceeds 80 percent. Activities such as clearcut harvest have longer lasting effects because they take habitat that may be (or may have been) suitable to red-shouldered hawk and make it unsuitable for approximately 50 years. Essentially, the effects of treatments in the past are manifest in the records and projections of suitable red-shouldered hawk habitat. These actions would be considered for each of the geographic areas described above.

Past and Reasonably Foreseeable Actions

Cumulative impact analysis includes consideration of past, present and reasonably foreseeable future actions as relevant to the issue. Forest projects considered in the cumulative impacts for this project are listed in Table 23. These are the recent decisions and reasonably foreseeable projects on the Chequamegon landbase that have the potential for impacts to red-shouldered hawks.

Table 23: List of Forest Vegetation Management Projects (Past and Reasonably Foreseeable) used for Impacts to Red-shouldered Hawks	
Project Name	***District***
Cayuga	Great Divide
Twentymile	Great Divide
Great Divide Red Pine Thin	Great Divide
Twin Ghost	Great Divide
Camp Four	Medford-Park Falls
Medford Aspen	Medford-Park Falls
Hoffman Sailor West	Medford-Park Falls
2009 Medford Spruce Thin	Medford-Park Falls
Riley Wildlife Management Area	Medford-Park Falls
Park Falls Hardwood	Medford-Park Falls
Fishbone	Washburn
NW Sands	Washburn
Washburn Red Pine Thinning	Washburn
Early Successional Habitat Improvement	Multiple Districts

Non-Forest Service lands were analyzed inside the project area boundary and within a 1 mile buffer outside the project area. The 1 mile distance exceeds the distance red-shouldered hawks are known to relocate following abandonment or disuse of a previously occupied nest site (Bosakowski 1999). This provides context for the relative availability of habitat on adjacent and other ownership lands and CNNF lands. There are approximately 3,339 acres of non-forest service lands within the Park Falls Hardwoods project area boundary, and an additional 20,752 acres outside of the project area boundary, and predominately outside of the District Boundary (Table 24). These non-forest service lands are owned by private individuals, industrial groups or the state of Wisconsin. Habitat determination of these lands was completed by interpreting 2005 National Agriculture Imagery Program (NAIP) aerial photos. NAIP aerial photos were used rather than WISCLAND data because the NAIP information is much newer and has better resolution at a finer scale.

Table 24: Forest Cover Type Composition in Acres of the Non-federal Lands (including land within the Park Falls Hardwoods project area and within 1 mile of the project area boundary).		
COVER TYPE	**TOTAL ACRES**	**%**
Agriculture	162	0.7
Aspen	7,089	29.4
Clearcut	821	3.4
Lowland Conifer	3,625	15.0
Lowland Hardwoods	1,109	4.6
Lowland Openings	5,485	22.9
Oak	0	0
Pine	231	1.0
Spruce/Fir	348	1.4
Upland Hardwoods	4,830	20.0
Upland Openings	76	0.3
Urban	279	1.2
Water	36	0.1
TOTAL	**24,091**	**100.0**

Private lands within the project area consist of approximately 1,240 aces managed by the State of Wisconsin Board of Commissioners for Public Trust Lands. Approximately ½ of this area is lowland bog and swamp conifer while ½ is mature northern hardwoods, with the hardwoods managed with uneven-

aged silvicultural techniques for profit and long-term fiber production. With the utilization of uneven-aged management for these hardwood stands, for the purpose of this analysis it will be assumed that the stand will retain 80% canopy cover following harvest (Welch 3-11-10 email).

Lands within a 1 mile buffer of the project area, largely outside of the Forest boundary, are a mix of Price County, Oneida County, private industrial, private, and State of Wisconsin Public Trust Lands ownerships. According to discussions with the adjacent landowners (Welch 3-11-10 email) there are approximately 3,800 total acres of Price County lands within this one-mile buffer, with upland acres consisting of aspen and mixed aspen forest types managed even-age at 40 year rotations. Oneida County owns approximately 4,200 acres within the 1 mile buffer with 2/3 of the upland acres aspen or mixed aspen forest managed even-aged on a 45 year rotation and the remaining third comprised of hardwoods managed uneven-aged. Private industrial forest own approximately 4,700 acres, of which 2/3 is aspen managed on 40 year rotation, 1/6 is uneven aged hardwood management, and 1/6 is in conifer plantations. The State of Wisconsin Board of Commissioners for Public Trust Lands owns another 3,500 acres of intermixed parcels. These parcels are ¾ swamp lands. Of the remaining ¼ acres in uplands, 2/3 of these are in aspen managed in a 65 year rotation and 1/3 are hardwoods managed with uneven age silviculture. The remaining private lands are smaller in size with scattered individual private ownership.

Comprehensive data on these private lands including age structure within each forest type category, specific management history, and future management plans are not available. Therefore the following assumptions are made:

- The age structure of the forested lands is similar to the age structure of the same forest types on the CNNF.
- All private forested lands are enrolled within Wisconsin's Managed Forest Law (MFL) program.
- Adjacent and other ownership lands that are classified as northern hardwoods are treated on a 15-year entry cycle with uneven-aged silviculture prescriptions that retain 80% canopy cover.
- Aspen stands are clearcut and regenerated when they are approximately 40-45 years of age, with the exception of approximately 570 acres of aspen on State of Wisconsin Public Trust Lands that would be clearcut on 65 year rotations (Welch 3-11-10 email).
- Lowland conifer or lowland hardwoods are managed if on productive sites (site indices > 35 or 45) by strip clearcut harvest with a rotation of 80-150 years depending on the site index (Welch 3-12-10 email)
- No forest cover type changes will occur (aspen is managed to remain aspen, etc).

Measures

Measures for estimating impacts to red-shouldered hawk include the amount of available nesting habitat.

In the effects analysis for red-shouldered hawks, suitable habitat is defined as northern hardwoods and hardwoods with hemlock, northern red oak, and lowland hardwoods. All of the above types must be uneven aged or 50+ years old to be considered suitable for red-shouldered hawks because that condition or age is approximately when the forest is expected to have a closed canopy and some trees would be large enough to be used for nesting (USDA, 2009b). Water is a critical element for red-shouldered hawk, however no definitive distance variable is currently available to use to refine this element in the model and because woodland ponds, small streams and wetlands and other ephemeral water resources are abundant throughout the project area and not considered a limiting habitat variable on the CNNF. Stands managed using even-aged silvicultural methods (clearcutting) are assumed to be unsuitable for a period of approximately 50 years following a treatment. Stands managed with uneven-aged silvicuture remain suitable if they maintain 80% or more canopy cover. Those hardwoods managed uneven-aged that reduce the canopy down to 70-79% will be considered unsuitable short-term (for 5 years).

Thresholds

In the species viability evaluation (SVE) process for the Forest Plan revision, no minimum numbers of red-shouldered hawk or its habitat were identified. However, Forest Plan FEIS, Alternatives 3-9 and the Selected Alternative were judged to result in beneficial effects to red-shouldered hawk (Forest Plan FEIS Appendix J, p. J-74) as a result of standards and guidelines protecting the species and the projected increase in northern hardwood forest types (see Forest Plan FEIS, Fig 3-13). The cumulative effects analysis for this project will determine if the trajectory of the Forest's acres of suitable red-shouldered

habitat is within the range of the Plan Alternatives 3-9, which, like goshawk, is an increase of between 0.26 percent and 0.51 percent in the amount of upland hardwood habitat after 10 years of revised Plan implementation. If so, effects are within the range analyzed in the Plan Revision process and accepted with the adoption of the 2004 Forest Plan. If not, then the project contributes to moving the forest outside what was anticipated for red-shouldered nesting habitat and the cumulative effects are beyond those analyzed in the Forest Plan revision process and management direction in red-shouldered habitat will be reevaluated.

While not a threshold, suitable nesting habitat for red-shouldered hawk will also be evaluated based on the Forest process paper: Habitat Models for Effects Analysis; Animal RFSS (USDA 2009b) in addition to the threshold discussed above. This model includes oak as suitable nesting habitat, along with the northern hardwoods analyzed in the Forest Plan.

Direct/Indirect/Cumulative Impacts

Table 25 shows the expected direct, indirect, and cumulative impacts to red-shouldered hawk suitable nesting habitat at various spatial and temporal scales. At the project level scale, there are impacts to suitable nesting habitat for red-shouldered hawk in Alternatives 1-5. Currently there are 19,220 acres of suitable nesting habitat within the Park Falls Hardwoods project area. There would be a reduction in suitable habitat immediately after harvest treatments in Alternatives 3-5 primarily due to reducing canopy closure below 80% in some of the northern hardwood stands. This short term reduction in habitat does not occur in Alternatives 1 and 2. After 5 years, it is assumed that the canopy will grow and increase to 80% canopy closure, after which there are no lasting impacts within the hardwood stands. The hardwood treatments causing a short term loss with reduced canopy cover will overall provide for increased tree diversity, structural diversity, and larger tree size which will improve suitable habitat for raptors over time. At the project level scale, all alternatives cumulatively show a small increase (about 2%) in red-shouldered nesting habitat within 5 years of implementation (Table 25).

Table 25: Red-shouldered Hawk Nesting Habitat by Alternative (Cumulative)

Park Falls Hardwoods Project Area	***Alt 1***	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Currently	19,220	19,220	19,220	19,220	19,220
Immediately following treatment	19,350 +130 ac +0.7%	19,298 +78 ac +0.4%	15,517 -3,703 ac -19.3%	12,856 -6,364 ac -33.1%	11,819 -7,401 ac -38.5%
Five years after treatment	19,541 +321 ac +1.7%	19,541 +321 ac +1.7%	19,541 +321 ac +1.7%	19,541 +321 ac +1.7%	19,541 +321 ac +1.7%
Medford-Park Falls District	***Alt 1***	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Currently	95,941	95,941	95,941	95,941	95,941
Immediately following treatment	96,114 +203 ac +0.2%	96,103 +162 ac +0.2%	92,322 -3,619 ac -3.8%	89,661 -6,280 ac -6.5%	88,624 -7,317 ac -7.6%
Five years after treatment	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%	96,537 +596 ac +0.6%
Chequamegon Landbase	***Alt 1***	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Currently	532,634	532,634	532,634	532,634	532,634
Immediately following treatment	530,900 -1,734 ac -0.3%	530,859 -1,775 ac -0.3%	527,078 -5,556 ac -1.0%	524,417 -8,217 ac -1.5%	523,380 -9,254 ac -1.7%
Five years after treatment	526,181 -6,453 ac -1.2%	526,181 -6,453 ac -1.2%	526,181 -6,453 ac -1.2%	526,181 -6,453 ac -1.2%	526,181 -6,453 ac -1.2%

Across the Medford-Park Falls District, there will be a decrease in suitable nesting habitat immediately following treatment in Alternatives 3, 4, and 5 (4-8%), with a slight increase (2/10 of a percent) in habitat for Alternatives 1 and 2 (Table 25). In all alternatives, there would be a cumulative increase in habitat of about 1% within 5 years of implementation at this scale.

The amount of suitable nesting habitat across the Chequamegon landbase decreases in all alternatives immediately following treatment as well as in 5 years following treatment. Cumulatively, Alternatives 1-5 show about a 1% decrease in red-shouldered hawk nesting habitat at the Chequamegon landbase scale. Since this slight decrease does not occur at the project or the District scale, and because the amount of hardwoods across the Forest remains on an increasing trend (see Figure 9), it is likely due to loss of oak habitat across the Forest.

Biomass (the deposit of coarse or fine woody debris) also plays a role in providing forage and cover for red-shouldered hawk prey species. Alternative 1 does not deposit coarse or fine woody debris to the forest floor through timber harvest operations. In the short term the amount of coarse and fine woody debris on the forest floor in Alternative 1 is not anticipated to change from the current accrual rate. Woody debris would be available for deposition at a natural interval from wind, or other disturbance events as the stands age and move toward break up. Biomass harvesting is allowed in all action alternatives: In Alternative 2 up to 854 acres, in Alternative 3 up to 1,045 acres, in Alternative 4 up to 1,217 acres, and in Alternative 5 up to 16,984 acres. Alternative 5 is the only alternative that would allow biomass removal in hardwood stands (tipwood removal only). Tipwood biomass harvesting is removal of the main stem from 4" diameter inside bark to approximately 1" inside bark, with all peripheral limbs remaining at the stump site. This tipwood biomass harvesting would remove approximately 1.7 tons/acre of material and leave approximately 8.6 tons/acre. However, the bulk of the remaining biomass is smaller than 1 inch diameter and will not provide the same structure for wildlife as the 1-4 inch diameter tipwood remaining in the hardwood stands in Alternatives 2-4. This small material may decompose faster and some additional woody debris would be crushed during harvest operations. Winter harvest only in the hardwood stands may lessen this impact. Existing structural features such as large downed logs, cavity trees and snags would be retained in treated stands in all action alternatives and would remain in Alternative 1. Since there is little published or unpublished information on the impacts of tipwood or biomass harvest on wildlife species in the upper Great Lakes region northern hardwood habitats or on how this material is utilized by red-shouldered hawk prey species, there is the potential for an unknown impact, particularly in Alternative 5. For additional information on biomass harvest and potential wildlife impacts, see the General wildlife – Coarse and fine woody debris section of this Chapter and the Project File (PF): Wildlife Specialist Report.

In summary, there is no impact to red-shouldered hawk in Alternative 1.

In Alternative 2 there is no impact to red-shouldered hawk due to the overall increase in nesting habitat at the project and District level in the short term and long term. In Alternative 2 there is only a small amount of biomass removal and it does not occur within potential nesting habitat. The threshold of effects would not be reached because there would be no reduction in the amount of northern hardwood habitat available in the project area.

In Alternatives 3, 4, and 5, there could be some impact to individual red-shouldered hawks, but there is likely no trend to federal listing or loss of viability. The threshold of effects would not be reached because there would be no reduction in the amount of northern hardwood habitat available in the project area. At the project area scale, habitat for red-shouldered hawk is expected to increase under all of the Park Falls Hardwoods alternatives in the long term by 1.7%, with a significant decrease in suitable habitat over the short term (19-39%). Biomass harvest could occur in all alternatives, with the greatest impact in Alternative 5 with up to 16,000 acres of biomass harvest of approximately 1.7 tons/acre. This determination is based upon professional judgment and specifically the high amount of short term loss of suitable nesting habitat within the Park Falls Hardwoods project area and the potential biomass harvest across all alternatives and the relatively unknown impact to red-shouldered hawk prey populations.

RFSS – Little brown myotis, northern long-eared myotis, and tri-colored bat.

Issue 2

The three species of bats analyzed in this section are considered cave-dwelling species that spend a majority of their maternity and/or hibernation period in caves, mines, or similar structures. Like many other cave- and mine-dependent bat species, disturbance during hibernation or maternity periods is a significant factor in their widespread decline (Thompson 2006). The foremost factor leading to population declines is unwarranted destruction of roost sites, particularly hibernacula. Until recently, widespread recreational use of caves and indirect or direct disturbance by humans during the hibernation period posed the greatest known threat to these species.

Recently a greater threat to hibernating bats has emerged in the northeastern United States in the form of a disease called white-nose syndrome (WNS). This disease is named for the white fungus evident on the muzzles and wings of affected bats. This disease was first documented in eastern New York during the winter of 2006-07. Since then WNS has rapidly spread to multiple sites throughout the northeast. White-nose syndrome has been associated with a recently identified fungus (Geomyces destructans) that thrives in the cold and humid conditions characteristic of the caves and mines favored by bats. In addition to the characteristic white fungus found on affected bats they will also have low body fat, will move to colder parts of the hibernacula, fly during the day and during cold winter weather when insects they feed upon are not available, and exhibit other uncharacteristic behavior (USDI 2012).

Since its initial discovery, WNS has spread quickly and at the end of the 2010-2011 hibernating season has been confirmed in 16 states and 4 Canadian provinces. More than half of the 45 species of bats found in the United States rely on hibernation for winter survival. Eleven cave-hibernating bats, including 4 endangered species and subspecies are already affected by or are potentially at risk from WNS (USDI 2012). Of these species, 4 are found on the Chequamegon-Nicolet National Forest (big brown bat, little brown myotis, northern long-eared myotis, and tri-colored bat). Big brown bats are typically found in lower numbers in the affected sites, and few have been found with the signs of WNS. Bats are dying in record numbers and as of January 2012 U.S. Fish and Wildlife Service biologists and partners estimate that at least 5.7 million to 6.7 million bats have died from WNS in the Northeast and Canada. In many hibernacula, mortality rates of 90 to 100 percent have been reached (USDI 2012). Due to these extreme declines many experts believe that the once-abundant and ubiquitous little brown myotis has the potential to become extinct in the Northeast in only 7-30 years, and that a similar fate may exist for the Indiana, northern long-eared, and tri-colored bats (Turner 2011).

Though WNS has not yet reached Wisconsin, it has come as close as southern Indiana and Missouri (approximately 200-250 miles from the southern Wisconsin state line) and Ontario, Canada (approximately 190-200 miles from the northern Wisconsin state line). As a result, the Wisconsin Natural Resources Board, listed 3 cave bat species (little brown myotis, northern long-eared myotis, and tri-colored bat) as threatened species, added the WNS fungus as a prohibited invasive species, and instituted mandatory decontamination procedures when entering or exiting caves or handling bats.

In 2011, the Eastern Region of the USFS along with the CNNF also listed these once common bat species as Regional Forester's Sensitive Species and because there has been no consensus from experts as to how WNS spreads, how to prevent its continued spread, or a possible cure, the Eastern Region has implemented a WNS Regional Response Plan with strict guidelines for the decontamination of persons and gear and has curtailed non-essential contact with bats (USDA 2011b).

It should be noted that on the Chequamegon-Nicolet National Forest, no bat-accessible mine openings, caves, or other structures that could be used for fall swarming or winter hibernation habitats are known to exist and the spread of WNS and disturbance of winter hibernacula is not an issue. However, Forest management actions that could be considered possible additional threats to the bats are associated with disturbance of summer roosting and foraging habitat.

Information for this analysis has been summarized from the Project File (PF), Addendum to Draft Biological Evaluation, Park Falls Hardwoods DEIS, February 2012, and supporting files associated with RFSS bats.

Affected Environment / Area

Eight bat specieshave been recorded in Wisconsin; which include the big brown bat (Eptesicus fuscus), silver-haired bat (Lasionycteris noctivagans), eastern red bat (Lasiurus borealis), hoary bat (Lasiurus cinereus), little brown myotis (Myotis lucifugus), northern long-eared myotis (Myotis septentrionalis), tri-colored bat or eastern pipistrelle (Perimyotis subflavus), and the Indiana bat (Myotis sodalis) which has not been found in Wisconsin since the 1950s. Of these species all have been documented on the Forest, excluding the Indiana bat. The Forest began active monitoring and surveying for bat species in 2006.

In 2006, absence/occurrence mist net surveys on the Medford-Park Falls Ranger District were conducted. Since then a different district has been surveyed each year between the months of June and August. Each Ranger District on the Forest is revisited every 5 years. In addition to mist-netting, site specific absence/occurrence acoustic surveys began in 2008, and in 2009 a Region-wide acoustic monitoring program was initiated across Forest Service Regions 8 and 9 in response to WNS, with 12 established survey routes on the Forest. The Forest additionally maintains and monitors nearly 80 bat houses across all five Ranger Districts. These bat houses are typically monitored a minimum of once per year between May and August. The most recent acoustic transects and/or mist net surveys conducted in the Park Falls Hardwoods project area occurred in July 2011. Mist net surveys conducted at Willow Springs tower and Foulds Springs pond resulted in 4 bats captured with 2 of those being little brown myotis. Acoustic data from these sites were also collected; however, an analysis of this data is not yet complete.

While little is known about the summer roosting and feeding habitat requirements for the 3 species of bats considered in this analysis, initial information concerning summer habitat indicates use of deciduous forest trees in landscapes that include interspersed non-forested patches. Also, while there are some species specific differences in use of summer roosting and foraging habitat between these 3 bats, there is enough similarity in the type of roosting and foraging habitat among the 3 species to analyze them together at the project scale.

For this analysis, the following suitable summer foraging and roosting habitat criteria were derived from USDA Forest Service Inventory and Analysis (FIA) data contained in the 2006 Conservation Assessment (CA) for Five Bat Species in the Eastern United States (Thompson 2006). The FIA habitat status data for the tri-colored bat and the northern long-eared myotis were used in conjunction with forest type codes. Potentially optimal or preferred suitable foraging habitat for these species could generally be defined as upland hardwood, bottom-land hardwood, and pine-hardwood forest types. Potentially optimal or preferred suitable roosting habitat could generally be defined as stands ≥60 years old in upland hardwood and pine-hardwood forest types. There is about 19,714 acres of bat foraging habitat in the project area and about 16,769 acres of roosting habitat in the project area.

Cumulative Impact Boundary

The cumulative impact boundary for this issue is Park Falls Hardwoods project area and includes MAs other than the 2B MA. While there are no harvest activities planned within the 8E, F, and G MAs, bat foraging and roosting locations are not dependent on MA boundaries, so all MAs were included as applicable. Due to limited impact of the proposed alternatives on bats, the impact analysis boundary was limited to the project area.

Past and Reasonably Foreseeable Actions

Beyond this project, there are no anticipated or planned projects that would affect suited bat foraging and summer roosting habitat within the project area.

Measures

Measures include percentages of foraging and roosting habitat with some type of harvest treatment proposed along with narrative on potential and expected impact to bats from the harvest activity.

Thresholds

No minimum numbers for these bats or their summer habitat have been identified for maintaining viability. White nose syndrome is the primary threat to viability. A WNS Regional Response Plan has focused protection efforts on guidelines for the decontamination of persons and gear and curtailing non-essential human/bat contact (USDA 2011b).

Direct/Indirect/Cumulative Impacts

No bat-accessible mine openings, caves, or other structures that could be used for fall swarming or winter hibernation habitats are known to exist on the Chequamegon-Nicolet National Forest including within the project area. Thus, there is no direct impact to the winter hibernacula in any alternative (Alternatives 1-5) and no direct impact to bat populations. Indirect impacts could occur if bats were impacted by potential changes to foraging and summer roosting habitat. In all alternatives, the proposed harvest treatments in foraging and roosting habitat maintain the age and type of forest identified above as potential habitat and in some cases may improve habitat for foraging by creating small openings and limited edge habitat. In addition, Forest Plan standards and guidelines may minimize any adverse by maintaining snags and large trees which are also key habitat components for bats.

There are about 19,715 acres of potentially suitable foraging habitat and approximately 16,769 acres of potentially suitable roosting habitat for these species across the Project Area.

In Alternative 1 (no action), no activities would be implemented in suitable habitat for these bat species. The result of not implementing the proposed activities within the project area would be the passive maintenance or enhancement of habitat. This would occur as some of the older stands gradually become decadent, increasing the number of snags and dead wood available for roosting. This uncertain use is speculative, so any changes in the condition of stands in the project area would not be possible to quantify and are not likely to have a discernible effect on the little brown, northern myotis or tri-colored bat. Also, since snags are not currently limiting the species in the project area, there would be no indirect effects from this alternative. Since there are no direct or indirect effects, there would also be no cumulative effects on RFSS bats or their habitat in Alternative 1.

In Alternatives 2 through 5, harvest treatments could occur in bat foraging and roosting habitat.

Within the project area there are about 19,715 acres of foraging habitat and 16,769 acres of roosting habitat for the little brown, northern myotis and tri-colored bat.

Proposed treatments to summer foraging habitat (i.e. improvement cuts, individual tree selection, and shelterwood) vary by alternative and occur on about 35%, 35%, 63%, and 75% (Alternatives 2, 3, 4, and 5 respectively) of suitable habitat. Bats forage along forest edges, over riparian areas (land adjacent to and influenced by bodies of water), along forest roads and trails, and in natural forest gaps or harvest-created openings. Bats feed on a variety of night-flying insects, catching them in the air or picking them off vegetation. Most bats prefer to hunt in small to medium forest openings or gaps, like those created by timber harvests, roads and water courses, or by lakes and ponds. Bats often forage along the vertical or horizontal edges where these habitats or different- aged forest stands meet and along forest corridors and buffer strips. Bat-foraging activity is often concentrated in riparian zones and in gaps in older, more-diverse forest stands. Riparian habitat is especially important because it provides drinking water and high quality foraging habitat, as well as high-quality roosting habitat in more level terrain where cold-air drainage is not a factor. Beaver ponds provide high-quality bat habitat that combines drinking, foraging and roosting resources. Bats often follow corridors of forest when traveling from roosts to feeding areas. Forest-management practices that create small forest openings may foster development of suitable foraging habitat and may even enhance roosts located along forest gaps and edges. Bats often forage along edges between intact forests and cut areas. Smaller harvest areas increase edge habitat per unit area, promoting plant and insect diversity that is beneficial to bats and other wildlife. The majority of the treatments proposed (98%) in bat summer foraging habitat within the project area are designed to establish an uneven-aged structure. These treatments leave a variety of tree sizes and ages and create small gaps similar to those formed by natural forest disturbances. This type of harvest treatment maintains diverse forest structure and roost trees, while creating small gaps and enhancing edge habitat for foraging. It also can promote diverse vegetation structure and some increases in herbaceous vegetation which is favorable to production of bats' insect prey. See "Forest Management and Bats", Taylor, 2006, Bat Conservation International. In summary, even though 35-75% of the summer foraging habitat for the little brown, northern myotis and tri-colored bat would receive some harvest treatment in Alternatives 2-5, the built-in project standards and guidelines and vegetation prescriptions (Appendix E) are anticipated to minimize any detrimental impacts to the summer foraging habitat and are likely to maintain or slightly improve foraging habitat for the little brown, northern long-eared and tri-colored bats.

Proposed treatments to summer roosting habitat (i.e. improvement cuts, individual tree selection, and shelterwood) vary by alternative and occur on about 39%, 34%, 68%, and 81% (Alternatives 2, 3, 4, and 5 respectively) of suitable habitat. The three bat species either roost in dead and dying trees (snags), especially beneath loose bark, in tree cavities and hollows, in crevices left by lightning strikes or in the foliage of living trees. These roosts are required for rearing young (maternity roosts), as migratory stopover sites and occasionally for hibernation. Most forest-bat species move frequently between roost trees. This is especially true of maternity colonies, although bachelor (all-male) colonies also exhibit this behavior. This roost switching may be an effort to avoid predators or parasites or to seek a warmer or cooler roost. For snag-roosting bats, switching could also be tied to the temporary nature of dead and dying trees. If a roost tree becomes unstable or falls, the bats will already know of an alternative roost (Taylor, 2006). While it is not uncommon for bats to return to the same roost tree or group of trees in the same patch of forest in successive years, there should be no direct impact on bats since the opportunity for the bats to re-establish a roost in the same patch of forest would still be available. The majority of the treatments proposed (99%) in bat roosting habitat (Alternatives 2-5) would maintain large trees, snags, and species variety throughout the area. In summary, even though 34-81% of the roosting habitat for the little brown, northern myotis and tri-colored bat would receive some harvest treatment in Alternatives 2-5, the built-in project standards and guidelines and vegetation prescriptions (Appendix E) are anticipated to minimize any detrimental impacts to the habitat and may be beneficial by providing a sustainable and evenly distributed supply of roost trees throughout the project area.

In summary, direct or indirect impacts to the summer foraging and summer roosting habitat for the little brown myotis, northern myotis or the tri-colored bat are not anticipated in Alternatives 1-5. While individual summer roosting trees or trees for maternity colonies may be removed due to single tree harvest during the winter, bats returning to roost in the summer will still have suitable roosting habitat within or close to the same location as the previous year. Since there are no direct or indirect effects anticipated, there would be no cumulative effects on RFSS bats or their habitat in any alternative.

RFSS - Spruce grouse.

Issue 2 / Objective 10

The habitat for spruce grouse as identified by the Forest Plan is near the minimum threshold identified for this species; therefore there is a need to increase the amount of habitat for this species where feasible. The project area contains some habitat for spruce grouse which could be improved / expanded within areas identified for treatment. Improvements to the habitat include developing conifer regeneration or an understory of jack pine, black spruce, or white spruce and reducing those species less. For this reason, several treatments proposed for other reasons have been modified to retain or expand elements important to spruce grouse.

Affected Environment / Area

Spruce grouse prefer northern coniferous forests containing short-needled conifer-dominated tree species (e.g. white or black spruce, balsam fir, tamarack, jack pine) (Gregg et al. 2004). These forest types provide a major food source for spruce grouse in the form of short-needle conifer (SNC) needles or from the understory vegetation that accompany these forest types. Additionally, these forest types also provide cover from inclement weather and predators. Ideal spruce grouse habitat in Wisconsin consists of young to mid-successional upland conifer with variable structure directly adjacent to a large black spruce swamp (100 acres +) (Gregg et al. 2004). Spruce grouse occupy a variety of forest settings (upland, lowland, mixed upland/lowland), that are dominated by short-needle conifers with similar structural elements. The key elements in this short-needle dominated habitat appears to be young or stunted trees (in lowlands) with a high enough stem density to provide birds with a food source and live branches at or near the ground that provide concealment and protection during nesting, foraging, and inclement weather (Gregg et al 2004, Boag and Schroeder 1992). The Conservation Assessment for Spruce Grouse indicates that spruce grouse prefer relatively younger stands (0- 30 years) that are periodically maintained by disturbance (Gregg et al. 2004).

Although observations of the species had occurred over time on the CNNF, surveys for the species outside the Forest's Breeding Bird Survey (BBS) were not conducted until 1992-93. During 1992-93, the CNNF conducted surveys with the assistance of Larry Gregg of the WDNR. This survey searched 19

sites containing lowland conifer suitable for spruce grouse, locating 15 individuals (Gregg 1993). Additionally, participants in a Breeding Bird Atlas survey for Wisconsin found spruce grouse in 0.4% of blocks surveyed (Gregg et al 2004). The species is considered to exist at low numbers in pockets of suitable habitat across the Forest.

Limiting Factors for spruce grouse include habitat loss, predation, and incidental take by hunters.

Loss of habitat has been associated with population declines. Because spruce grouse appear to desire earlier stages of short needle conifer forests, logging per se does not have a long-term effect on habitat. Rather, changes to the overall forest composition through conversion of short needle conifer to other forest types or the aging of short needle conifer forests has the greatest potential to negatively affect the species (Gregg et al. 2004, Robinson 1969).

Predation is assumed to be a major cause of mortality in spruce grouse. The conservation assessment for the species indicates that loss at egg or chick stage seems to be the period of greatest predation on spruce grouse. Species like the northern goshawk and barred owl are considered major predators for spruce grouse (Gregg et al. 2004). Accidental kills are known to occur in Michigan and Wisconsin where the species is not legal to harvest. To offset this potential impact, the CNNF in cooperation with the WDNR, annually post signs at access points used by ruffed grouse hunters to inform them of the potential presence and non-harvest status of the spruce grouse.

One spruce grouse has been reported as occurring in the Park Falls Hardwoods project area, located by a contract botanist conducting plant surveys. The only other documented spruce grouse sighting is from 1997 on the east side of Riley Lake Wildlife Management Area. Otherwise, there has also been an anecdotal report of 2 spruce grouse near Wabasso Lake. All three reports were in areas of larger mixed lowland conifer complexes.

Approximately 2,700 acres of suitable habitat exists in the Park Falls Hardwoods project area. The majority of these acres are in lowland conifer wetland complexes. Only 166 acres is suitable upland forest types that are adjacent to wetland complexes 90 acres in size or larger. No activities or treatments will occur in the lowland conifer wetland complexes in any alternative. Additionally there is another 2,600 acres of spruce/fir and lowland conifer on non-Forest Service lands that meet size and proximity criteria.

Cumulative Impact Boundary

Two spatial scales were used to evaluate the effects to spruce grouse habitat. Habitat for the species exists across the CNNF landscape in pockets. Analysis of habitat at the scale of the project area was needed to evaluate the direct and indirect effects. The CNNF level scale supplies the context for effects to habitat across the CNNF. With the current spruce decline epidemic affecting potential spruce grouse habitat across northern Wisconsin, it is appropriate to examine the potential effects to the species' habitat within the project area and at the scale of the entire CNNF.

Timber harvesting in suitable habitat for spruce grouse (upland) often follows even-aged management prescriptions and results in regenerating stands that are suitable to spruce grouse once regeneration is established. Often, the harvest takes a stand that has aged beyond suitability for spruce grouse and returns it to suitable conditions for the species. Other harvesting that makes a stand unsuitable would be the conversion of a forest type away from suitable short-needled conifer, for example, harvesting a jack pine stand adjacent to a large conifer wetland complex and planting with red pine would represent a long-term loss of habitat.

Past and Reasonably Foreseeable Actions

Beyond this project, there are no anticipated or planned projects that would affect suited spruce grouse habitat within the project area. See the beginning of this Chapter for the projects across the forest that were considered when determining the potential forestwide habitat changes for spruce grouse.

Measures

Measures of the objective include acres of habitat impacted and acres improved.

To analyze effects to the spruce grouse, lowland conifer habitats of all ages were considered to be suitable habitat if they occurred in a complex of 90 acres or greater. Additional upland habitat is in short-needled conifer habitat types including jack pine, upland spruce and balsam fir that are less than 30 years

of age, and all age classes of mixed aspen-white spruce-balsam fir. Additionally these upland stands are only considered suitable habitat it they are within 100 feet to qualifying lowland conifer habitat complexes. Approximately 70 percent of the species' habitat on the CNNF remains within the lowland short-needled conifer community.

Thresholds

In the Species Viability Evaluation (SVE) process for the Forest Plan Revision, no minimum numbers of spruce grouse or its habitat were identified and all alternatives were judged to result in the same ecological outcome for the CNNF (Outcome C) (Forest Plan FEIS, Appendix J, p. J-81) except for Alternatives 1 and 2 which received an Outcome D. Panelists based their judgments on the loss of upland habitat which ranged from -5.8% to -6.9% (in 10 years) and on the retention of short-needled conifers in other forest types and through adjacency considerations. Including the lowland conifer habitat, Alternatives 3-9 ranged from -1.64% to -1.97% loss in total habitat. The Selected Alternative projection for the first decade was for a loss of 9.9% of the upland habitat (loss of 2.82% in total habitat) for the species which groups it with Alternatives 1 (-16.3%) and 2 (-8.8%) in terms of upland habitat loss or -4.64% and -2.51% loss in total habitat, respectively. These alternatives received the D outcome; thus, losses approaching 16% of the upland habitat or 4.6% of the total habitat over the first decade would be a maximum threshold for effects on spruce grouse habitat.

The cumulative effects for this project will determine if the actions from the project are within Forest Plan projections for changes in suitable habitat acres and are within the range of effects analyzed for Forest Plan Alternatives 3-9. If so, the effects of the project are within the range analyzed in the Forest Plan FEIS. If not, a threshold will be crossed and the cumulative effects are beyond those analyzed in the Forest Plan.

Direct/Indirect/Cumulative Impacts

See Table 26 for a summary of expected habitat changes for spruce grouse. In Alternatives 1-5, no activities or treatments will occur in the lowland conifer wetland complexes. For all action alternatives (2-5), the only suitable upland habitat that will be impacted is forest type 11 (Balsam Fir – Aspen – Paper Birch) in a maximum of 3 stands. Two of these stands will receive an improvement cut harvest, which represents a short-term loss of habitat for spruce grouse. One stand will receive an overstory removal harvest treatment which represents a long-term loss of habitat that will be converted to northern hardwood forest type. Note that even though the stands harvested with the improvement cut harvest show up as a short term loss, the very long-term goal of these stands is to convert them to northern hardwoods by year 2065. They will show as suitable habitat again in 2019 for this analysis.

Also for all action alternatives, the possible long-term loss of habitat in the project area is 1 stand of 18 acres, representing a long term loss of 0.7% of the total suitable habitat. For short term impacts, Alternative 2 is 30 acres, Alternative 3 is 63 acres and Alternatives 4 & 5 are 71 acres. There are no other acres of loss or gain of suitable habitat between 2010 and 2019

Table 26: Acres of Spruce Grouse Habitat Impacted by Alternative

	Alt 1	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Habitat Improvement (acres)	0	0	24	52	60
Short Term Habitat Loss (acres)	0	30	63	71	71
Long Term Habitat Loss (acres)	0	18	18	18	18

Enhancement of spruce grouse habitat is proposed in Alternative 3 (24 acres), Alternative 4 (52 acres), and Alternative 5 (60 acres). This consists of planting black spruce in lowland hardwood stands proposed for harvest adjacent to lowland conifer wetland complexes and a portion of one stand that will emphasize retention of white spruce and reduction of balsam fir "thickets" during harvesting.

In summary, there will be no direct or indirect impact to spruce grouse because there will be no impact to the area of spruce grouse sighting in 2007 and any minimal reduction in habitat (18 acres) is offset by habitat enhancement in most action alternatives. Alternative 2 is the only alternative that has 18 acres

long term loss that is not offset by habitat enhancement, and this loss only represents 0.7% of the suitable habitat (not counting the 2,600 acres of adjacent habitat on non-Forest Service lands).

Since there are no direct or indirect effects to spruce grouse, no cumulative effects were estimated, and no thresholds for habitat have been reached as a result of any of the alternatives. Overall, the spruce grouse habitat enhancement in Alternatives 3, 4, and 5 results in a very slight increase in habitat in the project area over the long term. Alternative 2 would represent less than 1% loss of habitat over the long term.

MIS - Brook trout.

Objective 11

One of the objectives in the Forest Plan (Plan Goal 1.5) and in this project is to develop and maintain a population and distribution of beaver across the forest that avoids detrimental effects on cold-water fisheries. There are about 23 miles of cold water, native trout streams within the project area. Beaver activity (primarily feeding or utilization of aspen close to these streams) results in lack of shade trees adjacent to the stream and potentially leads to increases in water temperature, making it unsuitable for cold water species. Information for this objective has been summarized from the Project File (PF), Management Indicator Species (MIS) Report and the Aquatic Resources Report for the Park Falls Hardwoods Project, and supporting files. For additional information on other potential impacts to the aquatic resource, see the Aquatic Resources section in this Chapter.

Affected Environment / Area

Brook trout require cool water temperature (maximum summer water temperature less than 23° C, suitable spawning sites, relatively stable water flow, and structural features such as overhead cover, woody debris, and deeper holes. Threats include loss or degradation of habitat features, elevated stream temperatures and sedimentation (Forest Plan FEIS p 3-156). Beaver can adversely affect stream cover by cutting down adjacent alder and aspen thus reducing shade, increasing water temperature, blocking migration with dams, causing sedimentation of spawning areas, and altering habitat which causes increased competition from other fish species. They can also cause water temperatures to rise above 23°C by blocking stream flow with dams, in addition to reduction in tree or brush cover. Timber harvest can adversely affect brook trout habitat also due to reduction in cover by tree cutting or by encouraging aspen which then attracts beaver.

There are 1,072 miles of Class I and II trout streams on the CNNF, representing 13.8% of the Wisconsin trout streams (Forest Plan FEIS p 3-12). In the Park Falls Hardwoods project area there are 7 classified trout waters totaling approximately 30 miles: Foulds creek, Sieverson Creek, Elk River, Spring Creek, Little Willow Creek and two spring ponds (Foulds spring pond, 5.5 acres and Little Willow spring pond, 3.4 acres). All of the streams and spring ponds within Park Falls Hardwoods project area have naturally reproducing trout populations. None of the above waters are artificially stocked with hatchery trout. See Table 38, Aquatic Resources section of this Chapter for additional information on the existing condition of trout habitat within the project area.

The affected area for determining maintenance or improvement to coldwater fisheries are the trout streams in the Park Falls Hardwoods project area and their designated buffer for the purposes of beaver management (0-350 or 400 feet – Forest Plan, p. 2-17).

Cumulative Impact Boundary

The cumulative impact boundary for this objective is the project area. Only actions within the project area are relevant to determining how the objectives for this proposal are being met.

Past and Reasonably Foreseeable Actions

Beyond this project, there are ongoing road maintenance projects which include culvert resizing and replacement. These projects would not directly impact stream temperatures, though they would result in less sediment reaching trout waters. See the Aquatic Resources section of this Chapter for information on proposed road projects in all riparian zones, including trout buffer zones.

Measures

The amount (acres) of timber harvest within the trout stream buffer zone is the measure utilized for determining how this objective is met.

Direct/Indirect/Cumulative Impacts

Alternative 1 will have less benefit to brook trout by not actively converting aspen to long-lived species. There will be no adverse impacts on any trout streams or spring ponds as there will be no timber harvesting or road building. Alternative 2 has 216 acres treated within 300 or 450 feet of trout streams. Alternative 3 has 183 acres treated. Alternative 4 has 230 acres treated. Alternative 5 has the highest amount with 294 acres treated. Table 27 shows the acres of harvest within each trout system by alternative and by harvest type.

Table 27: Acres of Harvest Within Trout System* Buffers

		Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Foulds Buffer=838 Acres	Hardwood Individual Tree Selection	0	50.6	4.8	61.4	80.2
	Convert to Hardwoods or Pines	0	20.0	19.6	20.0	20.0
	Improvement Cut	0	9.7	15.0	12.8	15.0
	Thin Pine/Spruce	0	2.2	2.2	2.2	2.2
	Modified Clearcut Aspen	0	0	0	2.2	0
Little Willow Buffer=318 Acres	Hardwood Individual Tree Selection	0	16.2	17.5	1.3	17.5
	Convert Early Successional To hardwoods	0	0	0	0	0
	Improvement Cut	0	22.0	28.3	28.3	28.3
	Thin Pine/Spruce	0	9.6	9.6	9.6	9.6
	Modified Clearcut Aspen	0	0	0	0	0
Elk Buffer=1060 Acres	Hardwood Individual Tree Selection	0	69.3	66.4	75.3	101.3
	Convert Early Successional To hardwoods	0	0	0	0	0
	Improvement Cut	0	11.6	15.6	13.1	15.6
	Thin Pine/Spruce	0	4.4	4.4	4.4	4.4
	Modified Clearcut Aspen	0	0	0	0	0
	TOTALS	**0**	**216 (10%)**	**183 (8%)**	**231 (10%)**	**294 (13%)**

***** Foulds trout system consists of Foulds and Sieverson creeks along with Foulds spring pond. Elk trout system consists of Elk River and Spring Creek, and the Little Willow system contains the Little Willow Creek, Willow Creek, Willow Spring ponds, and unnamed tributary to Little Willow.

While harvesting takes place within the 300 and 450 foot buffer zone of select trout streams, all of the harvesting except for clearcuts will move the overstory vegetation away from aspen or maintain it in a northern hardwood condition, and will keep canopy closures at 75% or more (80% in that area of the stand adjacent to the coldwater system). Any roads constructed within the riparian zones of any trout waters would follow Wisconsin Forestry Best Management Practices (BMPs) for Water Quality and Forest Plan standards and guidelines. See the Aquatic Resources section of this Chapter for information on proposed road projects in all riparian zones, including trout buffer zones. Also, the clearcut harvest proposed in Alternative 4 would be modified within the 2.2 acre trout buffer zone to reduce the aspen component and maintain shade (Appendix E, Table E5, M1d-M1f, and G158).

All of these harvest treatments will either (1) maintain the current condition for trout streams, or (2) will work towards long-term benefits for brook trout by moving the overstory forest type to long lived species (pine, hardwoods) and away from early successional species such as aspen and balsam fir. Again, Alternative 4 shows 2.2 acres of aspen clearcut and regeneration. This is unlikely. The placement of the boundary of the harvest unit or location of reserve islands for wildlife will preclude any clearcutting of aspen within the trout buffer zones for this small acreage. It should also be noted that much of the acreage described above and displayed in Table 27 are larger stands with only a small portion or narrow strip that falls within the trout buffer zone. Forest Plan standards and guidelines would apply to all treatment areas further reducing any potential for detrimental impacts relating to brook trout (Appendix E, Table E5, G158).

In summary, Alternative 1 is not pro-active in converting aspen or other early successional forest types to hardwoods or other longer lived species. Alternatives 2-5 are pro-active in converting some acres away from early successional species to long-lived species. This will reduce the impacts from beaver over the long term. While it is shown that there are 2.2 acres within the trout buffer zone in Alternative 4 proposed for a modified clearcut harvest treatment to reduce the aspen component and maintain shade, potential for detrimental impacts relating to brook trout would be avoided by project design measures. Based on the amount of the trout buffer zones treated in each action alternative to reduce aspen and retain long lived species that would be less palatable to beaver (8-13%), there is little difference in how each meets the objective of maintaining or improving trout fisheries. Because of ongoing road maintenance projects, all the alternatives will continue to reduce potential for sedimentation impacts to brook trout and other fisheries.

Early successional wildlife.

Issue 3

One of the goals of the Forest Plan is to conserve habitat capable of supporting viable populations of existing native species of wildlife (Forest Plan, page 1-4). The importance of aspen to early successional wildlife species is based on both the long-term maintenance of the aspen type, and the amount of young age aspen. By maintaining the aspen type and improving the age-class distribution of the aspen, habitat for many native wildlife species would be maintained or improved. Game species that utilize clearcuts include whitetail deer, ruffed grouse, and woodcock. Songbirds utilizing clearcuts include chestnut-sided warbler, clay-colored sparrow, Eastern towhee, Nashville warbler, and white-throated sparrow. Golden-winged warbler (another songbird) utilizes upland and lowland shrub habitat, which in Wisconsin, is largely aspen clearcuts less than 10 years old and alder swamps. Recent assessments conducted on the Forest indicate a negative trend in the amount of young age class aspen, as well as aspen cover types across the forest (Quinn, et.al, 2006, Quinn and Schmidt, 2007). These assessments note that harvest to regenerate aspen has decreased on the forest as compared to the past, and that there is a substantial percentage of aspen cover type that is beginning to succeed to other forest types due to advanced age. The same trends are currently occurring within this project area, primarily due to Forest Plan goal of Management Area 2B. In fact the project area is well over goal for the amount of aspen (0-10% in MA 2B and current amount is at 25% for the MA2B portion of the project area). Even though part of the purpose and need for the Park Falls Hardwoods project is to decrease the amount of early successional habitat within the area, there are some differences between alternatives that could occur in the timing, location, and amount of aspen reductions that could have impacts on early successional wildlife species. Information for this analysis has been summarized from the Project File (PF), Wildlife Specialist Report, Park Falls Hardwoods Project, and supporting files.

Affected Environment / Area

The discussion for this issue is limited to 4 wildlife species that represent a range of species that utilize early successional habitat.

Ruffed Grouse: Ruffed grouse are one of the species most closely tied to the aspen resource. Throughout much of its range, aspen appears to be the most important plant for grouse. Counts of drumming males in spring indicate that northern hardwood forests typically reach a density of 1-2 drumming males/ 40 hectares, while aspen forests in the Lake States can support 4-8 drumming males/ 40 hectares (Dessecker and McAuley, 2001, p. 457).

White-tailed Deer: White-tailed deer are habitat generalists and can use a wide variety of forest and non-forest types; however, they are most abundant in early successional forests (like aspen and jack pine), and regenerating forests of all types are preferred by deer.

American Woodcock: Like ruffed grouse, American woodcock is an early successional species. In fact, they use many of the same habitats, including various ages of aspen. Yearly spring singing ground surveys are conducted across the eastern United States. There has been a long-term (1968-2007) decline of 1.8% per year in woodcock populations in the central region, which includes the state of Wisconsin.

Golden-winged Warbler: The golden-winged warbler is a neo-tropical migrant songbird with a breeding range centered on the northern Great Lakes and northwest into Canada. Northern Wisconsin is in the core range for the species, with about 80% of the total population occurring in the upper Midwest. Currently there are concerns over long-term, range-wide declines in the species. Populations of golden-winged warbler have declined across their range with a 2.4% rate of decline throughout, and a 2.1% decline in Wisconsin (Martin et al 2007). One possible reason includes loss of breeding habitat (they strongly favor both young aspen and lowland shrubs, especially alder).

Park Falls Hardwoods project area currently has the following early successional habitat:

104 acres of upland openings
3,557 acres of alder (lowland brush habitat)
663 acres of aspen 10 years old or less

There are 40 openings in the Park Falls Hardwoods project area which have an average size of 2.6 acres, ranging from 0.5 to 11 acres. While Forest Plan direction on page 3-8 states “Forest openings are allowed to naturally re-vegetate, however, some will persist (i.e., frost pockets).”, none of the 104 acres of openings will be artificially maintained in the Park Falls Hardwoods projects area, but some of these may be naturally perpetuated through the effects of frost.

Alder wetlands are abundant in the Park Falls Hardwoods area, as they are in much of Price County and most of northern Wisconsin. The 3,557 acres of alder are fairly long and narrow, occurring adjacent to streams, rivers, and other wetlands. There are some larger blocks of alder, around 200 or more acres in size, with the alder in the Park Falls Hardwoods project area having an overall average stand size of 27.6 acres.

There are currently 663 acres of young (0-10 years old) aspen present. This is primarily due to timber harvesting using the clearcut harvest method. Clearcutting removes most of the mature trees, because aspen needs lots of sunlight to regenerate and grow. This creates a temporary opening that lasts approximately 10 years, at which point the aspen is normally over 12 feet tall and no longer represents early successional habitat.

The affected area for direct and indirect impacts is the MA 2B portion of the Park Falls Hardwoods project area.

Cumulative Impact Boundary

The MA 2B portion of the Park Falls Hardwoods project area is utilized for cumulative impacts. Park Falls landbase and the Medford-Park Falls District are used for context of the project area impacts.

Past and Reasonably Foreseeable Actions

Within the project area, there are no anticipated or planned projects that would affect early successional wildlife habitat. On the Park Falls landbase and on the Medford-Park Falls District, there are multiple recent and reasonably foreseeable projects that contribute to the amount of early successional wildlife habitat and were used to provide context to the early successional habitat impacts within the project area.

Measures

Indicators for impacts to early successional wildlife species are the total amounts of aspen and the amount of aspen that is 0-10 years old.

Direct/Indirect/Cumulative Impacts

Alternative 1 would have no harvesting of aspen or any other forest type. Instead the aspen would be unharvested, and would passively move towards other forest types. This conversion would take multiple decades and would result in a long-term loss of some of the aspen in the project area. There are currently 467 acres of aspen over age 65 that would likely be lost as a habitat type in the near future. Aspen habitat is critical at all stages for ruffed grouse, and a "key cover type in northern Wisconsin" for maintaining golden-winged warbler. Aspen at various ages is also important to deer, woodcock, and numerous other species. There would be a direct/indirect impact on grouse, woodcock and golden-winged warbler populations within the Park Falls Hardwoods project area. This impact would be an overall permanent loss of habitat for these species. With approximately 663 acres of 0-10 year old aspen currently in the Park Falls Hardwoods project area, there would likely be a small impact on these species in the short term (next 5-8 years) as the current young aspen matures past age 10. There would still be some habitat available in terms of alder swamps, remaining young aspen, and upland openings, so no impacts on deer populations are expected.

Alternatives 2-5 will all provide for early-successional habitat (mostly aspen clearcuts) with aspen regeneration on 180, 369, 466, and 369 acres respectively. In 5 years there will be 436, 626, 705, and 626 acres of young aspen habitat available. This will provide young aspen for early-successional habitat for species such as grouse, woodcock, deer, and golden-winged warbler. In Alternatives 2-5 there would be an overall reduction in aspen, but some young aspen would be maintained (Table 28).

Table 28: Acres of Aspen (in 5 years)

Aspen Age	Existing	*Alt 1*	*Alt 2*	*Alt 3*	*Alt 4*	*Alt 5*
0 to 10 years	663	239	436	626	705	626
All Ages	6049	6049	5213	5058	5284	4458

All alternatives represent a permanent loss of some habitat for grouse, woodcock and golden-winged warbler from the reduction in total amount of aspen. Alternative 4 shows an increase in young aspen from the current condition, while Alternatives 1 and 2 show a marked decrease. Alternatives 3 and 5 are about the same as the existing condition for the amount of aspen that will be 0-10 years old in the area. The amount of alder and upland openings is static for the short term, with the acres of upland openings declining over the long term. Though there is a loss of some early successional habitat in all alternatives, for the overall project area this represents a change in less than 1% of the total upland acres for all cover types into or out of early successional habitat from the current condition.

While Park Falls Hardwoods management direction (MA 2B) from the Forest Plan directs management away from early successional habitat, there are many acres that are managed as aspen across the Park Falls landbase. Approximately 49% of the upland acres on the Park Falls landbase are managed for aspen. In terms of early successional habitat, here defined as aspen age 0-10 years old, there are approximately 5,500 acres present on the Park Falls landbase, with another 553 acres ready to harvest from the recent Camp 4 project decision. There have been 670 acres of aspen regeneration harvest in the last 2 years on the Park Fall's landbase, and 1,681 acres since 2005.

General wildlife – Coarse and fine woody debris.

Issue 4

There are several overall biodiversity concerns related to timber harvesting. Timber harvesting has the potential to lead to less complexity in both structural diversity and tree species type diversity. Stands with a mix of tree species and tree and shrub height diversity are often used by a variety of game and non-game wildlife species. A conifer species component can be an important structural element that provides habitat for songbirds and cover for other wildlife. Some of the existing stands in the project area have a mix of other species, which if maintained as an element of the stand, provide species and structural diversity. Many of the specific harvest proposals have prescriptions that help maintain or increase the species and structural diversity within the harvest unit. In addition, design criteria have been incorporated

in all harvest areas that reduce the potential for loss of within stand species and structural diversity. See Appendix E, Table E5, G21, G25, G51, G52, G53, G61, G118, G120-G123, G389, and G394-G396. Because within stand structure and diversity pertaining to large or coarse woody debris is maintained in all alternatives, this issue is not addressed further in this document. For additional information on this issue, see the Project File (PF), Wildlife Specialist Report, Park Falls Hardwoods Project.

Traditional timber harvests have generally removed only wood greater than four inches in diameter from the bole of a tree. In biomass harvests, where some or all of the material is used as biofuel, all or part of above ground portion of a tree is removed, including trunk and branches smaller than four inches in diameter. For purposes of this analysis, this smaller diameter material is considered the tipwood of the tree and would be the portion harvested for biomass. During traditional timber harvest operations, this material would be left on the ground and represents fine woody debris (FWD) due to its smaller size (less than 4" in diameter). In the Park Falls Hardwoods project, some tipwood removal is allowed in all action alternatives. Allowed biomass harvest includes whole tree (removal of all woody biomass less than 4" diameter inside bark including any limbs and leaves) and fuel rods (removal of the tree bole and potentially some branches from 4" inside bark to approximately 1" inside bark).

It is difficult to determine any impacts to species or communities from biomass harvesting, as there is currently a lack of research and a high degree of uncertainty on this evolving product extraction. From WDNR Herrick et al 2008 it seems possible that biomass harvesting could reduce small mammal, lichen, and fungi diversity and richness, and possibly allow for increased seedling and herb browse by white-tailed deer. At a minimum, any biomass harvesting will follow new Wisconsin Forestland Woody Biomass Harvesting Guidelines (BHGs) (WDNR Herrick et al 2009). See Appendix E, Table E5, G16, M16a-M16d.

Because biomass harvesting for energy is relatively new for the CNNF a letter dated May 21, 2010 provided some direction for MA 2B. It states: "Avoid biomass harvesting in hardwood stands within Management Area 2B when retaining fine woody debris would contribute to other resource objectives. This is not a prohibition on biomass harvesting in northern hardwoods stands in MA 2B. However, if biomass harvesting is considered in hardwood stands, I expect rationale to be disclosed on the anticipated benefit." The purpose and need for the Park Falls Hardwoods project describes a need for biomass harvesting from a utilization standpoint, as well as from a standpoint of following national mitigation strategies for climate change by increasing the use of biofuel to reduce fossil fuel use. Because of the potential benefit of biomass harvesting, biomass harvesting was considered in hardwood stands in the proposed action (Alternative 5). Other action alternatives limit biomass harvesting to non-hardwood stands.

The discussion following in this issue (general wildlife – coarse and fine woody debris) focuses on the fine woody debris and any potential impacts to wildlife from biomass harvest. Information for this analysis has been summarized from the Project File (PF), Wildlife Specialist Report, Park Falls Hardwoods Project, and supporting files.

Affected Environment / Area

While there are few studies on the effects of biomass harvest on wildlife species, some have concluded that retention of logging residues can increase structural heterogeneity, cover, shelter, food, and positively influence species richness (WDNR Herrick et al 2008). Other studies found that retention of fine woody debris benefits mice and vole populations, which are a prey species to many higher-order predators such as hawks, feline, and canine species (Payne & Bryant 1994, Manning & Edge 2008). Manning & Edge found in their Pacific Northwest study that fine woody debris functioned for deer mice as thermal cover, communal nest sites and protective cover. They also indicate that total volume of fine woody debris may be a good indicator of habitat quality at the population level and that the retention of fine woody debris conserves biodiversity and maintains the prey base of sensitive species (in this case northern pygmy owl and northern spotted owl). While we do not have the species pointed out in this pacific northwest research project, we could substitute local wildlife that are predators of small mammals (such as hawks, owls, wolves, etc.).

Vanderwel et al (2008) suggests that downed material originating from harvesting operations, including slash and unmerchantable logs, can constitute a large down woody debris pulse that maintains elevated abundance in the short term. This is important because down woody debris inputs between harvests may

be low as selection harvesting generally reduces densities of large-diameter trees and snags, all of which are important sources of down woody debris.

Northern Research Station (Forest Service), Institute for Applied Ecosystem Studies, Research Ecologist Deahn DonnerWright is currently conducting research on biomass harvest on the east side of the CNNF. While data has not yet been analyzed, DonnerWright's initial assessment is that there were red-backed salamanders found under the 1-4" (fuel rod) biomass pieces. More information will be available from this study in future years as analysis is completed.

It is estimated that there is currently about 3 dry tons of fine woody debris per acre on the ground (Welch 2010).

The affected area is the acres impacted by timber harvest within the project area.

Cumulative Impact Boundary

For this issue, the cumulative impact boundary is the same as the boundary for direct and indirect impacts and is limited to areas specifically impacted by timber harvest within the project area. There is no information indicating that impacts could extend beyond the immediate area of the harvest operations.

Past and Reasonably Foreseeable Actions

As noted for other issues, the vegetation structure in the area includes past activities and events. The area has an existing component of about 3 dry tons of fine woody debris per acre (Welch 2010) that is currently on the ground. There are no reasonably foreseeable projects within the cumulative impact boundaries.

Measures

This issue is measured by the amount of fine woody debris left on site in stands where harvest could occur as well as the trend of woody debris compared to this existing condition (3 tons per acre).

Threshold

There are no established thresholds for fine woody debris. The Forest Plan and subsequent direction establish standards, guidelines, and other measures to ensure that both coarse and fine woody debris are left on site following all harvest activity. The assumption is that these measures are adequate and that if an alternative fell outside of these measures then there could be some unintended impacts to wildlife as a result. Recently developed Wisconsin's BHGs are also a guide for determining unintended consequences.

Direct/Indirect/Cumulative Impacts

It is difficult to determine any impacts to species or communities from biomass harvesting, as there is currently a lack of research and a degree of uncertainty on this evolving product extraction. Based on current research, it seems possible that biomass harvesting could impact small mammal, lichen, and fungi diversity and richness, and possibly allow for increased seedling and herb browse by white-tailed deer. Based on current Forest Plan direction to emphasize vegetation structure and diversity elements such as fine woody debris in MA 2B, differences by alternative in these elements are displayed below.

Table 29 shows the estimated acres and an estimate on the maximum amount of biomass removal allowed (not required) in each of the Park Falls Hardwoods action alternatives. While acres treated and amounts of biomass harvest allowed gives some indication of the extent of this activity, it does not correlate well with actual amounts of fine woody debris left on the forest floor following implementation. As noted above, there is currently about 3 dry tons per acre of woody debris on the forest floor in the project area. While biomass harvest removes wood products from the area, the treatments for biomass harvest also require leaving some woody debris at the harvest sites. Table 29 shows the total biomass or fine woody debris (in dry tons) that would be expected to be left on the ground in each alternative for all harvested stands and shows that as a percentage of change from the existing condition of 3 tons per acre.

Table 29: Maximum Estimated Biomass Amounts Potentially Removed and Remaining in Treated Stands by Alternative

	Alt 2	Alt 3	Alt 4	Alt 5
Harvest Treatment Acres	8,722	8,969	14,366	17,024
Harvest Generated Biomass/Fine Woody Debris (dry tons)	48,819	50,455	80,155	94,160
Pre-harvest Naturally Occurring FWD on Forest Floor (dry tons) – Existing FWD Condition	26,166	26,907	43,098	51,072
Total FWD Potential on Ground Following Harvest Treatment (dry tons) – Existing + Harvest Generated	74,985	77,362	123,253	145,232
Harvest Treatment Acres Allowing Biomass Harvest	854	1,045	1,217	16,984
Allowed Biomass Harvest (dry tons)*	3,382	4,507	5,394	19,568
Total Biomass (FWD) Remaining in All Harvested Stands (Total Generated + Existing - Removed) (dry tons)	71,603	72,855	117,859	125,664
% Change From Existing Condition	+174	+171	+173	+146
Average Biomass (FWD) Remaining in Harvested Stands (Total Remaining / Harvest Treatment Acres) (dry tons / acre)	8.2	8.1	8.2	7.4
Total Uncrushed Biomass (FWD) Remaining in All Harvested Stands (Total Generated + Existing – Removed / 2) (dry tons)	35,802	36,427	58,930	62,832
% Change From Existing Condition	+37	+35	+37	+23

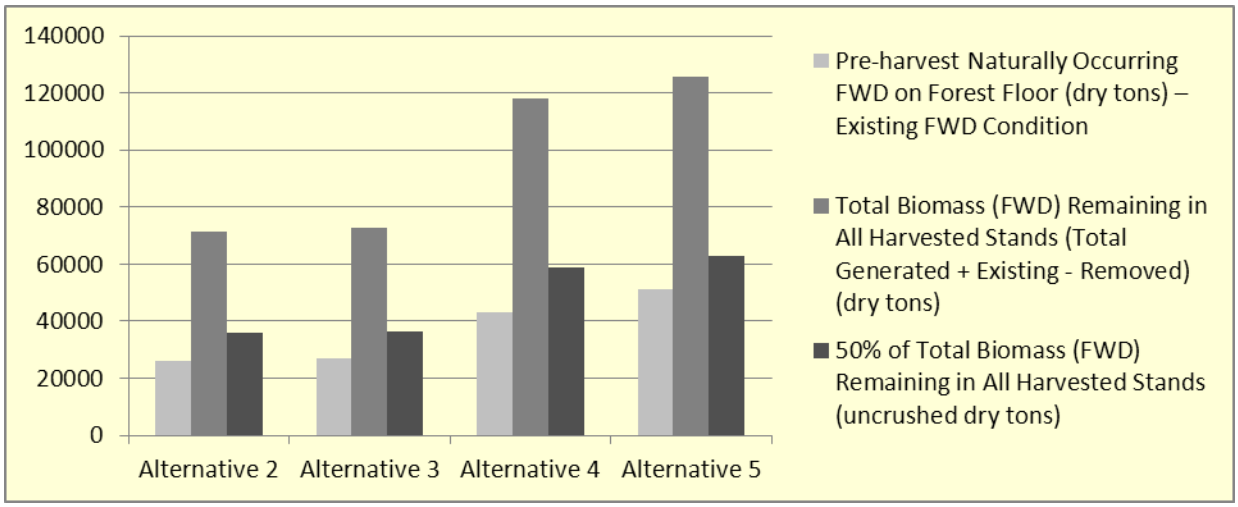
***** Maximum allowable tipwood removed in harvested stands

Also shown is the expected average FWD (dry tons per acre) remaining following harvest activity. Wisconsin's Forestland Woody Biomass Harvesting Guidelines (BHGs) state that "The ultimate goal is to have 5 or more oven dry tons per acre of FWD (Fine Woody Debris) on site following the harvest." These guidelines further define FWD on site following harvest as "a combination of pre-existing down FWD, along with wood that was cut or broken during harvest operations and left on the ground".

For purposes of this analysis, there is an estimate that 50% of the woody debris to be left on site after harvest operations would be crushed by equipment operating in the area which is shown in Table 29 as Total Uncrushed Biomass (FWD) Remaining….. Part of the benefit of FWD to wildlife is utilization for hiding from predators. Also, uncrushed FWD may act as a barrier to some wildlife which in turn could benefit understory plants that are typically browsed. Based on specialist field observations, this 50% assumption is meant to express a maximum potential impact scenario to wildlife.

Figure 10 graphically displays the relationship of dry tons of FWD pre and post harvest (total and uncrushed).

Figure 10: Pre and Post Harvest - Dry Tons of Fine Woody Debris in Harvest Areas



Alternative 1 (No Action) would not have FWD removed or added to the forest floor through harvest operations. It is estimated that there would be an average of 3 dry tons/acre for all forested stands present as an existing condition (Welch 2010).

As displayed in Table 29 and Figure 10, the timber harvest areas in Alternatives 2 through 5 would collectively have almost triple the FWD component in comparison to the existing condition. Because of the amount of biomass harvest in Alternative 5 (addition of biomass harvest in hardwood selection harvests), it is not quite triple the existing component of fine woody debris. Even assuming the worst case scenario for amount of FWD that would be crushed (50%) and not providing maximum wildlife habitat value, there is still more FWD deposited on average in each of the action alternatives compared to the existing condition and what would be present in the No Action alternative (Figure 10).

As mentioned earlier, the BHGs include a guideline for keeping an average of 5 dry tons of FWD in areas following harvest. While individual stands and treated areas may vary, on average, Alternatives 2, 3, 4, and 5 have 8.2, 8.1, 8.2, and 7.4 dry tons per acre of FWD remaining in the stands following harvest which exceeds the desired 5 tons per acre identified in Wisconsin's BHGs. It should be noted that this is an average across all stands that have timber harvest treatments with or without biomass harvest. Some harvest treatments in each of the alternatives (clearcuts and shelterwoods) utilize whole tree harvesting which could produce about 6 tons of biomass per acre which would be harvested. These areas include measures for leaving the tops of 1 in 7 trees for FWD which meets the 5 dry tons of FWD left after harvest. Other harvest treatments only utilize 1-4 inch diameter tipwood or fuelrods (thinning, selection harvest) which produces less than 1 dry ton per acre that would be harvested and would leave more than 7 tons per acre on the forest floor as FWD.

In summary, the amount of biomass harvest identified in the action alternatives does not seem to cross any thresholds for providing FWD that remains after harvest. Alternative 5 does have less FWD debris remaining in harvest areas because of the large amount of acreage harvested that includes biomass product extraction (northern hardwood selection treatments). From the research that is currently available (Vanderwel, Herrick, and others) leaving more woody debris on site is better than less for many wildlife species. Clearcut and shelterwood harvest treatments would have the least amount of FWD remaining on the forest floor when biomass harvest is allowed, and this does not change by alternative. Also, even though these harvest treatments result in about 6 dry tons per acre removed for biomass product, the minimum 5 tons recommended in Wisconsin BHGs would remain as FWD.

All Alternatives meet or exceed Forest Plan standards and guidelines and Wisconsin BHGs. See Appendix E, Table E5, G16, M16a-M16d.

Soils

Issue 5

Soil disturbance caused by heavy equipment used for harvesting may have negative effects on soil physical, chemical and biological properties and could reduce long-term forest site productivity. Use of heavy rubber-tired or tracked equipment creates risk of soil compaction, rutting, displacement, and erosion. Removal of merchantable tree boles or whole trees (bole plus crown) could affect total site nutrients. If the severity, areal extent, and duration of soil disturbance are great enough to negatively influence the availability of water, nutrients, and oxygen to tree roots, then the ability of a site to sustain productive forest growth could be reduced. The Park Falls Hardwoods project proposes activities that would include use of heavy equipment to harvest and remove tree boles or whole trees, and construct/reconstruct and decommission roads. External comments also expressed concerns for potential detrimental effects to soil productivity from biomass removal and related changes to soil respiration and carbon uptake. Information for the soils impact analysis has been summarized from the Project File (PF), Soil Resource Report for the Park Falls Hardwoods Project, and supporting files.

Affected Environment / Area

The soil resources of the forest are mapped and characterized within a multi-scale, hierarchical, ecological classification framework as described by Cleland et al (1997). Land type phases (LTP) provide the most site-specific scale of soil information by defining similar ecological conditions relating to soil texture, moisture, nutrients, drainage class, slope and other physical, chemical and biological

characteristics. LTP maps have been intersected with the proposed timber harvest stands and road construction areas in each alternative to identify the specific soil type(s) for each (Soil Resource Report Appendices A and B).

The Alternative 2-5 proposed treatment areas occur within 20-23 different LTP map units of the Flambeau Silt Capped Drumlins (40-60%), Glidden Drumlins (25-40%), Chequamegon Washed Till and Outwash (11-17%), and Northern Highland Outwash Plains (3-8%) Land Type Associations, LTA. The primary glacial landforms are outwash plains (averaging 15%), and drumlin ground moraine (average ranging 85%). Topography ranges from nearly level to steep, with about 92 percent of the treatment areas having <15% slopes, and 8 percent of the areas with slopes ranging from 15-45%, in Alternatives 2-5. Soil surface texture is coarse sandy materials (loamy sand, loamy fine sand) for 7%, moderately coarse loamy materials (fine sandy loam, sandy loam) for 37%, and medium-textured loamy materials (silt loam) for about 55% of treatment areas in Alternatives 2-5. Soil internal drainage class is moderately-well or better for about 60% of the treatment areas, with 40% of the sites having somewhat poor to poor internal drainage. Table 30 displays the names of soil types that overlap with treatment areas proposed in the Park Falls Hardwoods project, along with associated acres and percent of total acres for each action alternative. Soil types associated with each timber stand are listed in Appendix A of the Soil Resource Report, with ratings for potential effects from proposed activities.

Table 30: Soil Type and Acres (%) by Alternative Treatments

Soil Type	Alternative 2 Acres (%)	Alternative 3 Acres (%)	Alternative 4 Acres (%)	Alternative 5 Acres (%)
Au Gres	24 (<1)	50 (<1)	71 (<1)	71 (<1)
Chequamegon	1483 (17)	2177 (24)	2365 (16)	3242 (19)
Croswell-Chinwhisker	50 (<1)	55 (<1)	63 (<1)	119 (<1)
Keweenaw-Pence	152 (2)	83 (<1)	154 (1)	228 (1)
Lupton-Cathrow-Tawas	0 (0)	3 (<1)	3 (<1)	3 (<1)
Magnor-Very Stony Magnor	2243 (26)	3177 (35)	4796 (35)	5709 (33)
Minocqua-Wozny-Pleine	378 (4)	432 (5)	319 (2)	499 (3)
Newood	3172 (37)	1943 (22)	4497 (31)	4841 (28)
Padus	104 (1)	80 (<1)	356 (3)	378 (2)
Padus-Karlin	15 (<1)	15 (<1)	15 (<1)	15 (<1)
Peeksville	65 (<1)	28 (<1)	47 (<1)	65 (<1)
Pelissier	0 (0)	14 (<1)	14 (1)	14 (<1)
Pesabic	120 (1)	161 (2)	217 (1)	231 (1)
Rubicon-Sayner	40 (<1)	40 (<1)	40 (<1)	40 (<1)
Sayner-Lindquist	18 (<1)	142 (2)	232 (2)	307 (2)
Sayner-Pence-Vilas	286 (3)	180 (2)	260 (2)	303 (2)
Shanagolden	10 (<1)	0 (0)	10 (<1)	10 (<1)
Springstead	0 (0)	0 (0)	22 (<1)	22 (<1)
Stanberry	90 (1)	58 (<1)	95 (<1)	143 (<1)
Stanberry-Park Falls-Wozny	80 (<1)	136 (1)	136 (<1)	135 (<1)
Tipler-Manitowish	23 (<1)	24 (<1)	204 (1)	205 (<1)
Vilas-Lindquist	338 (4)	105 (1)	373 (3)	373 (2)
Wormet	30 (<1)	66 (<1)	75 (<1)	75 (<1)
Grand Total	8722 (100)	8969 (100)	14,366 (100)	17,024 (100)

There are no known areas within the Park Falls Hardwoods project boundary where productivity of the land has been permanently impaired due to historical activities (Forest Plan, FEIS, p 3-39). On-site

monitoring of soil resource impacts within the Medford-Park Falls Ranger District has shown no long-term impairment of the land from similar project activities on the same soil types as listed in Table 30 (USDA Forest Service, 2002b, 2005b, 2006b, 2008b, 2009e, 2010b). All proposed treatment areas have been field investigated by resource specialists collecting site specific data for this project, with no existing soil resource concerns identified. On May 4, 2010, a soils scientist drove through most of the Park Falls Hardwoods project area and conducted on-site investigations of 8 proposed harvest areas in hardwood, oak, aspen, red pine and lowland hardwood stands. The soil types reviewed included Vilas-Lindquist, Sayner-Pence-Vilas, Sayner-Lindquist, Padus, Newood, Chequamegon, and Magnor-Very Stony Magnor, which are found on about 89% of the proposed treatment areas (Table 30). Less than 1% of the areas visited had detrimental soil resource effects remaining from past treatments. About 32 percent of the proposed harvest areas in Alternatives 2-5 have had one harvest, while 68 percent have had no harvest in the last 32 years, as documented in the CNNF timber stand history files. The previous harvests were primarily for salvage after wind storms, with some commercial thinning, shelterwood, or clearcutting. All treatment areas would have had harvests dating beyond the 32 year records. Currently, more than 99% of the acres proposed for treatment within the project area boundary are maintained in a non-detrimentally disturbed condition, with less than 1% (52, 54, 86, or 102 acres for Alternatives 2-5 respectively) conservatively estimated to be detrimentally disturbed as a log landing, main skid trail, or temporary road from previous management activities. Future trends indicate ground disturbing activities such as harvesting, road construction, and mechanical site preparation would be reduced over time as the Forest Plan is implemented (Forest Plan FEIS, p 3-40).

The affected area for analysis of direct and indirect effects of the proposed activities to the soil resource is that portion of a treatment area where activities would take place. As quantified in the following Measures section, equipment would travel about 13 percent of the acres harvested. Potential effects to the soil resource are reasonably confined to the soil directly beneath where the activity would take place, such as the operation of machinery to cut and remove trees. For example, heavy equipment causing soil compaction that reduces pore space for air, roots, and water within a portion of one treatment area does not affect pore space on adjacent areas.

Cumulative Impact Boundary

The analysis boundary for cumulative effects will be the Land Type Phases (LTP) within treatment areas for the Park Falls Hardwoods project. The land dedicated to the existing road system within the project area is considered part of the infrastructure required to access and manage the CNNF and is excluded from the affected area when analyzing potential soil disturbance for this project. Expanding the cumulative effects analysis area would only serve to dilute the effects to soils from all proposed project activities by including lands with no existing detrimental soil conditions and no present or future plans for treatment. Of the 38,598 acres of National Forest System (NFS) lands in the Park Falls Hardwoods Project area, between 0 and 44% is proposed for harvest activities. There are no other ground disturbing project activities from a previous decision pending within the project area. This leaves about 56 to 100% of the National Forest lands in the Park Falls Hardwoods Project area that would not have potential ground disturbing activities planned at this time.

Past and Reasonably Foreseeable Actions

Numerous historic, natural and human caused ground disturbing events, such as, windstorms, turn of the century (late 1800's to early 1900's) logging and associated fires, road and railroad building, have taken place in and around the area of cumulative effects analysis. While these events have influenced the existing condition of the soil resource, there are no known adverse residual soil resource impacts from past ground disturbance. There are no other project decisions with ground disturbing activities planned that remain to be implemented or that would have any direct, indirect or cumulative effects to the soil resources within the Park Falls Hardwoods project boundary or proposed treatment areas. At this time there are no other specific actions known to be planned within the Park Falls Hardwoods Project area of cumulative effects analysis for the soil resource.

Measures

The measures for the soil productivity issue are acres/percent of soil disturbance and acres/percent of detrimental disturbance.

Measurement techniques defined by Region 9 (FSH 2509.18, R9 Supplement, pages 7-13) are used to measure existing soil disturbance from previous activities. These methods are primarily ocular qualitative assessments that are followed up by quantitative monitoring where management practices appear to have produced unacceptable results. Field monitoring of soil resource impacts for LTPs across the Forest has shown that initial harvest entries leave between 1-3 percent of a treatment area in a detrimentally disturbed condition from compaction of major skid trails, temporary haul roads and log landings. Second harvest entries utilize existing trails, roads and landings and may detrimentally disturb about 1-2 percent of additional land area (USDA Forest Service, 2000a, p 3). Subsequent harvest entries utilize the existing trails, roads and landings with little additional detrimental soil disturbance expected. Forestwide standards and guidelines for soils (Forest Plan, page 2-3) states the Forest will use the R9 handbook definitions for detrimental disturbance threshold values for soil displacement, erosion, rutting, nutrient loss, and compaction.

The CNNF goal for soils is to provide desired physical, chemical and biological soil processes and functions on the Forests to maintain or improve soil productivity (Forest Plan, p 1-4). The Forest Service Handbook for Soil Management in Region 9 sets soil quality standards (USDA Forest Service, 2005c, p 5-13) and measurement techniques to determine detrimental soil conditions. Forest-wide standards and guidelines for soils (Forest Plan, p 2-3) states the CNNF will use the R9 handbook definitions for detrimental disturbance threshold values for soil displacement, erosion, rutting, nutrient loss, compaction, burning, and maintaining ground cover. Region 9 measurement standards include:

- Detrimental erosion – presence of rills, gullies, pedestals and soil deposition
- Detrimental displacement – removal of the forest floor and more than 1 inch of surface mineral soil
- Detrimental compaction – soil surface strength and density increase of more than 15%
- Detrimental rutting – more than 5% of an activity area has ruts 6 inches deep and 10 feet long
- Detrimentally Burned – entire forest floor consumed down to bare mineral soil, fine roots and organic matter charred in upper 1 inch of mineral soil, soil reddish in color (**Note:** There is no burning planned for the Pak Falls Hardwoods project)
- Detrimental loss of productivity – a 15% reduction in long-term soil productivity based on any combination of the above thresholds, organic matter loss and/or impaired nutrient cycling

The indicator of the effects of soil disturbance is the intensity, areal extent and duration of the impacts for each treatment area. Detrimental disturbance exist when the severity of soil impacts exceeds the R9 measurement standards over a large enough area for a long enough time. At least 85 percent of a treatment area must be maintained in a non-detrimentally disturbed condition to meet National and Region 9 soil quality standards. If 15 percent or more of a treatment area is in a detrimentally disturbed condition, then the area is considered impaired, unless restoration is successfully implemented. For this report, duration for short-term effects to soil is considered to be less than 10 years or the shortest amount of time between harvest entries. Duration for long-term effects is considered to be greater than 10 years.

Direct/Indirect/Cumulative Impacts

The effects of the alternatives were assessed on a site-specific basis to determine if the intensity, extent and duration of potential soil disturbance would cause appreciable change in soil properties to be considered detrimental to the long-term productivity of the land. Alternatives 2-5 propose actions that have the potential to change soil properties through erosion, displacement, compaction, rutting, and nutrient removal.

The magnitude of potential direct, indirect and cumulative effects on the soil resources is estimated from standard soil ratings and criteria-based interpretations, and includes consideration of assigned resource protection measures. These measures are listed in Appendices A and B of the Soils Resource Report and discussed in the effects analysis below. Protective measures include site-specific design measures, Forest Plan standards and guidelines, and forestry best management practices that are assigned where appropriate to avoid or minimize potential negative effects to the soil resource. Table E5, Appendix E of

this document provides a complete list of mitigation measures. Tables F2 and F3, Appendix F provide a list of applicable measures for each individual treatment area.

Implementation and effectiveness monitoring of similar project actions across the CNNF has indicated site-specific design measures and best management practices to be highly effective in minimizing potential adverse effects to soil and water quality (USDA Forest Service, 2001b, 2002a, 2002b, 2003b, 2004c, 2005a, Shy and Wagner, 2007, p 33). Proposed treatment areas would be monitored during project implementation to ensure contract specifications and design measures are followed. Selected treatment areas would be monitored by interdisciplinary teams to evaluate whether ground conditions meet acceptable limits of change for measurable and observable soil properties.

In Alternative 1, the potential for soil compaction and rutting is very low since no activities involving operation of heavy equipment in the forest are proposed. Existing compaction from previous harvest entries would gradually be mitigated through natural soil forming processes, plant root development, and freeze-thaw cycles. The potential for soil erosion and displacement is also very low since no new ground disturbing activities are proposed. Geologic erosion would continue at a minimal rate of less than 0.18 tons/acre/year. The potential for impacts to inherent soil productivity are very low since there would be no ground or vegetation disturbing activities. Natural soil formation processes would continue, biomass would accumulate, organic matter would accumulate and be incorporated into the soil surface, and the biological and geo-chemical cycles would continue. Inputs to the system include atmospheric deposition and weathering of parent materials. Annual nutrient balances based on estimated inputs and outputs would tend to increase as succession progresses (Pritchett, 1987, p 190). There would be no adverse nutrient loss with Alternative 1, therefore no appreciable effects to the soil resource or long-term productivity of the land. The decommissioning of existing roads would not be completed in Alternative 1, so return of these roads to productive soil resource over time would not officially begin by implementing Alternative 1.

There are no direct, indirect, or cumulative detrimental effects to the soil resource as a result of Alternative 1. The cumulative detrimental effects would remain equal to the past detrimental effects which are conservatively estimated to be less than 1%.

Alternatives 2-5 have the potential to affect soil resources through timber harvest operations and road construction, reconstruction, or decommissioning. The Soil Resource Report, Appendices A and B, lists treatment area specific information including soil type, rating hazard, soil limiting factors, applicable Forest Plan standards and guidelines, and recommended season of operation for heavy equipment. The following tables summarize the site-specific ratings by type of activity or potential soil disturbance. All ratings are for the most limiting season or conditions, before soil resource protection measures have been assigned.

A rating of slight indicates little or no restrictions are necessary for equipment use, or no rutting or erosion is likely. A moderate rating indicates one or more limitations reduce site suitability for equipment use, or ruts are likely without some seasonal restrictions, or erosion control measures may be needed. A severe rating indicates limitations that make equipment use difficult without major seasonal restrictions or special equipment, or the soil would rut readily without operating restrictions, or significant erosion would be expected without costly control measures. Implementing the identified site-specific design measures will reduce the potential risk of soil impacts by a minimum of one rating level. Thus, a rating of moderate for erosion would be reduced to slight, and so on.

The following tables summarize the potential for soil impacts from project actions. Table 31 displays equipment use ratings for acres of proposed treatment. These ratings include equipment use for harvesting and road construction, reconstruction, or decommissioning. Table 32 displays harvest acres rated for potential soil compaction and rutting from proposed activities.

Table 31: Soil Disturbance Risk for Woodland Equipment Use

Soil Disturbance Risk Woodland Equipment Use	Alternative 2 Acres (%)	Alternative 3 Acres (%)	Alternative 4 Acres (%)	Alternative 5 Acres (%)
Slight	696 (8)	464 (5)	1035 (7)	1288 (8)
Moderate	5085 (58)	4437 (50)	7653 (53)	8936 (52)
Severe	2941 (34)	4068 (45)	5678 (40)	6800 (40)

Table 32: Soil Disturbance Risk for Compaction and Rutting				
Soil Disturbance Risk Potential for Compaction and Rutting	**Alternative 2 Acres (%)**	**Alternative 3 Acres (%)**	**Alternative 4 Acres (%)**	**Alternative 5 Acres (%)**
Slight	4288 (49)	2738 (31)	6328 (44)	6987 (41)
Moderate	1493 (17)	2177 (24)	2374 (17)	3251 (19)
Severe	2941 (34)	4054 (45)	5664 (39)	6786 (40)

Compaction and Rutting: As shown in Table 32, potential for soil compaction and rutting from operation of heavy equipment is slight for about 31-49% of the proposed treatment areas that have sandy textured, well drained soils in Alternatives 2-5. The operating season could be year round, except for periods of excessively wet conditions, such as annual spring thaw or major rainfall events.

Potential for compaction and rutting is moderate for about 17-24% of the treatment areas on the finer textured, moderately-well drained soils in Alternatives 2-5. These fine sandy-loam or silt loam soils hold moisture in surface horizons longer and lose strength when near saturation. These soils hold up well to equipment use when dry because as soil moisture content decreases, soil strength increases and compaction potential decreases (NCASI 2004, p 2). Therefore, a protective measure restricts the operating season to winter (frozen ground) or dry summer/fall for each treatment area with a moderate rating, to minimize the potential for detrimental soil disturbance.

Potential for compaction and rutting is severe for about 34-45% of the proposed treatment areas in Alternatives 2-5 due to poor internal drainage on all or a portion of the treatment areas. These soils are wet near the surface year round and a design measure restricts equipment operation to frozen ground only. Five year results of a long-term site productivity study concluded that harvesting aspen when soils were frozen had little effect on physical soil properties and produced a fully stocked stand of aspen suckers (Stone and Elioff, 1998, p 56-57). This research is directly applicable to the Park Falls Hardwoods Project aspen stands on wet (somewhat poorly or poorly drained) soils in Alternatives 2-5. Effects to the physical properties of all soils with poor internal drainage are minimized through frozen ground operation of heavy equipment, regardless of forest type. By restricting the harvest operations to frozen ground, the potential risk for compaction and rutting is reduced to slight for these treatment areas.

In addition to the treatment areas identified for winter only operations due to soil resource characteristics, another 6707, 6659, 12,071, or 14, 505 acres of northern hardwood individual tree selection harvest in Alternatives 2-5, respectively, will have a frozen ground restriction because they are in MA 2B (Forest Plan, p 3-11). Thus, 88, 88, 92, or 93% (7711, 7922, 13284, or 15799 acres) of the proposed harvest areas in Alternatives 2-5 will be restricted to frozen ground operations, with less than 1% detrimental rutting and compaction expected.

Potential for compaction and rutting is also reduced by operating low ground pressure equipment (tracked harvesters and wide rubber-tired forwarders) over snow, forest floor, logging slash, and surface rock. About 85% of Alternatives 2-5 proposed treatment areas have a very stony or stony ground surface. A Michigan study intentionally tested the latest harvesting equipment on wet, fine sandy loam soil and found no compaction or rutting that exceeded acceptable limits (Miller et al, 2001, p 3). About 55-66% of the proposed treatment areas in Alternatives 2-5 are on, sandy to loamy, moderately-well to well drained soils that provide good support for heavy equipment when the surface is dry, with minimal rutting and compaction risk.

Main trails near log landings have repeated use by harvesting equipment and therefore, have a higher potential for compaction, depending on moisture conditions if the ground is not frozen. There would be an increase in bulk density on the main skid trails, with detrimental compaction expected on about 1% of the frozen ground treatment areas and 1-2% of the non-frozen treatment areas. Potential for long-term detrimental compaction or rutting is minimized by limiting the operating conditions to dry or frozen ground. About 150 acres of paper birch shelterwood harvest would have a second entry overstory removal harvest within 3-5 years. Existing landings and main skid trails would be used, with no new detrimental compaction or rutting expected on these sandy to loamy, well drained to moderately-well drained soils.

Log landings where wood is temporarily stored until it can be trucked away are primarily located adjacent to haul roads in the road right of way and would be detrimentally compacted during harvest operations. The decking and removal of wood products would occupy about ¼ to ½ acre for each 60 to 80 acres of harvest in most cases, or about 0.4 to 0.6 percent of a harvest unit, and would not add appreciably to the total areal extent of detrimentally disturbed soil. Whole-tree yarding, slashing, and biomass removal operations may require the larger sized landings to accommodate all of the equipment and associated activities. The Park Falls Hardwoods project does not prescribe whole-tree or biomass harvest, but would allow such operations if requested by the timber purchaser. Landing areas for frozen ground harvest units are usually not detrimentally compacted and about 88 to 93% of the acres treated in Alternatives 2-5 would require winter only harvest. Some landings would be scarified and re-vegetated, and some would be left to recover naturally. The period of time for natural recovery varies by soil characteristics and severity of compaction and while freeze-thaw cycles may hasten recovery, the effects may be assumed to persist for several decades (NCASI, 2004 p 62). Again, frozen ground operations on 88-93% of the proposed harvest areas would not be expected to cause detrimental compaction, which shortens the period of time for natural recovery of these sites.

Permanent roads and trails are not part of the productive land base and are not considered in assessing potential detrimental compaction and rutting. Alternatives 2-5 propose constructing about 1.0-1.4 miles (3 or 5 acres, assuming a 28' maximum clearing width) of temporary roads with individual road lengths varying from .03 to .3 miles. Temporary roads are not part of the permanent transportation system and are subject to soil quality standards. The soil within about a 28 foot wide clearing limit could be detrimentally compacted during construction and the 14 foot road surface would be compacted from repeated hauling of wood products. This would be a short term effect, as these temporary roads would be decommissioned upon completion of the proposed projects. Decommissioning the new temporary roads and the 30-31 miles of existing roads as proposed in Alternatives 2-5 may involve discing to loosen compaction and/or allow natural processes to eliminate existing compaction over time, returning this land to productive forest.

Soil scientists and resource specialists have monitored harvest treatment areas across the CNNF with the same or similar landtype phases/soils. Findings to date indicate no evidence of reduced long-term productivity (threshold values exceeded) due to compaction and rutting (USDA Forest Service 2000 a-c, 2001 a-c, 2003 a-b, 2004 c-d, 2005 a-b, 2006 a-c, 2007 a-d, and 2008 a-d, 2009 c-e, 2010 a-c).

In summary, harvest activities would be designed to utilize existing roads, primary skid trails, landings and back in spurs to the extent possible to avoid or minimize soil compaction and rutting across treatment areas. Operating seasons based on soil type would be stipulated in the timber sale contracts and soil moisture conditions and harvest equipment impacts would be monitored by Forest Service timber sale administrators. Harvesting operations would be stopped when soils become saturated to the extent that detrimental compaction and rutting is likely or begins to occur. Forest Plan standards and guidelines would apply to all treatment areas further reducing any risk of rutting or compaction (Appendix E, Table E5, G18, G19a, and G19b).

There would be long-term detrimental soil compaction on primary skid trails and landings from operation of heavy equipment on about 1% of the frozen ground harvest areas and 2% of the non-frozen ground harvest areas, or about 97, 100, 154, or 182 acres of potential detrimental compaction in Alternatives 2-5 respectively. The extent, intensity and duration of compaction would be minimized for more than 98% of the Alternatives 2-5 proposed treatment areas, through operating requirements and soil protection guidelines. This is a conservative estimate, yet well within Region 9 soil quality standards. Long-term productivity of the land would not be impaired by soil compaction or rutting from the proposed activities.

Erosion and Displacement: Table 33 displays harvest acres rated for potential soil erosion and displacement from proposed activities. As shown in Table 33, the potential for erosion and displacement is slight for 67-79% of the treatment areas proposed for Alternatives 2-5, indicating little or no erosion or displacement is likely where mineral soil is exposed to rainfall. These areas have slopes that range up to 15%, but commonly have 4 to 10% gradients.

Table 33: Soil Disturbance Risk for Erosion and Displacement				
Soil Disturbance Risk Potential for Erosion and Displacement	**Alternative 2 Acres (%)**	**Alternative 3 Acres (%)**	**Alternative 4 Acres (%)**	**Alternative 5 Acres (%)**
Slight	5877 (67)	7091 (79)	10,071 (70)	12,356 (73)
Moderate	2845 (33)	1864 (21)	4281 (30)	4654 (27)
Severe	0 (0)	14 (<1)	14 (<1)	14 (<1)

The potential for erosion and displacement is moderate for 21-33% of the treatment areas in Alternatives 2-5, indicating some erosion is likely if mineral soil remains exposed to rainfall. Skid trails down short steep slopes, when unavoidable, need to be stabilized with simple erosion control measures such as covering with logging slash or constructing water bars to protect exposed soil until the site is re-vegetated. Slopes may range up to 30%, but commonly have 15 to 25% gradients. Implementing appropriate erosion control measures for exposed soil on steep slope areas will reduce the potential risk for erosion from moderate to slight.

The potential for erosion and displacement is severe for one 14 acre stand proposed for harvest in Alternatives 3, 4, and 5, indicating erosion is likely if mineral soil remains exposed to rainfall. With a slope range of 15-45% for this stand, the operation of equipment up and down slope where mineral soil would be exposed to rainfall should be avoided through treatment area layout, or trees should be cut by hand and cabled from above or below. Harvesting machines may also reach trees from above and below on short steep areas. Keeping equipment off of steep areas and cabling trees will not expose excessive mineral soil and risk of erosion would then be slight.

The forest floor cover such as litter, slash and surface rock protects the soil from erosive forces of raindrop impact and runoff. An undisturbed and totally covered forest soil usually yields no surface runoff, thus, it has no sheet and rill erosion (Dissmeyer and Foster, 1980, p 7). Tracked or rubber tired harvesting machines (fell, limb and cut to length) and rubber-tired forwarders (haul) are used in 90% of the tree harvest operations in the project area and the average ground traveled is 11% or less of a sale unit for all harvest types (Schumacher, 2002). The two machines typically operate on the same trails and run on top of slash generated from the harvested trees, surface rock and forest floor litter. Potential to expose mineral soil is minimal. Verry (1972, p 283) found no evidence of accelerated erosion after clear-cutting an aspen stand in Minnesota. A few scattered areas (25-50 sq ft each) of exposed soil may occur within harvest areas due to maneuvering machines over uneven ground. These isolated areas will re-vegetate naturally within one or two growing seasons and are not an erosion concern. Operation of this type of harvesting equipment does not remove the surface organic or mineral soil layers, thus, soil displacement rarely occurs. About 154 acres of paper birch shelterwood harvest would have a second entry overstory removal harvest within 3-5 years. Existing landings and main skid trails would be used, with no detrimental erosion or displacement expected because all disturbed soil areas would be stabilized as required during and after use to control erosion. Whole-tree or biomass harvest would be allowed if requested by the timber purchaser in Alternatives 2-5 and would be completed as part of a single entry operation. In some harvest operations full-length trees may be pulled to a landing with a grapple skidder, allowing the limbed tree-tops to drag on the ground. This will cause some mixing of the organic and mineral soil materials but is not considered detrimental displacement (USDA Forest Service, 2005c, p 10). Again, 88-93% of the proposed harvest areas in Alternatives 2-5 will be restricted to frozen ground operations, so minimal ground disturbance and mineral soil exposure is expected.

As described earlier, landings are locations where wood is temporarily stored until it can be trucked away. They are often located on open areas adjacent to woods roads and the wood is placed directly on the undisturbed ground surface. A landing “spur” within or adjacent to a harvest unit, may be approved by the Sale Administrator when decking wood along the road is not permitted. A spur typically is an area about 40 feet by 100 feet and wood is placed on undisturbed ground, if possible. Some spurs may require clearing of trees, stumps, rocks or other debris. Some soil may be displaced in this process. Potential for soil erosion is very low because level, well drained upland areas are generally designated and natural ground cover would be re-established within one or two growing season. Primary skid trails near landing areas would have more exposed mineral soil due to repeated use. These areas would re-

vegetate naturally within two growing seasons or be stabilized with a slash cover or other erosion control measures through the timber sale contract, as needed.

Potential for soil erosion and displacement exists when mineral soil is exposed during the road construction process. All road construction projects follow Forest Plan guidelines on page 2-38 that require utilizing Wisconsin Forestry Best Management Practices (BMPs) and Wisconsin Construction Site Best Management Practices Handbook to stabilize disturbed soil during and after use. Forest Plan standards and guidelines for soil, water resources and transportation systems would be followed. No detrimental soil erosion would be expected. Detrimental soil displacement would occur on portions of the new temporary roads (1.0-1.4 miles) where the organic surface and more than one inch of mineral soil may be bladed off when removing stumps and debris to prepare the roadbed. These temporary roads would be decommissioned upon completion of vegetation management activities and proven soil stabilization practices such as water bars, seeding, and mulching would be applied where appropriate following Wisconsin Forestry BMPs and Forest Service Soil and Water Conservation handbook practices. No long-term detrimental displacement effects to the project area are expected from temporary road construction and use. New permanent forest roads (6.3-11.9 miles) and existing re-constructed roads (10.9-17.0 miles) would be maintained as part of the transportation system necessary to manage the forest and provide public access for recreation. Alternatives 2-5 also propose to reconstruct (brush and blade) 17.7-26.2 miles of existing system roads that would be used as haul roads only in winter. The lands committed for use as “system” roads, trails, and other administrative facilities are not considered detrimentally disturbed.

Decommissioning 28.9- 30.9 miles of existing roads is proposed in Alternatives 2-5. The CNNF road inventories show that more than half of the roads identified for decommissioning since 2006 are already physically closed and/or over grown with woody vegetation and would require no ground disturbing closure activity. Some existing temporary roads and the new temporary roads constructed for this project may be disked to loosen compaction, which would expose and displace some mineral soil in the process. However, these roads would most likely be allowed to re-vegetate and rely on natural processes to eliminate compaction, returning this land to productive forest over time. In either case, the goal is to stabilize these sites and eliminate erosion potential. Mitigation measures would be identified and implemented, as needed, to further minimize potential for erosion while these sites are stabilized.

Geologic erosion would continue at a minimal rate of less than 0.18 tons/acre/year (Patric, 1976, p 572). Patric (1976, p 576) also notes the overwhelming weight of evidence supporting the view that soil losses from responsibly managed forest land are slight compared to those that accompany most other land uses.

In summary, all proposed ground disturbing activities would be designed to eliminate or minimize potential for soil erosion and displacement. Where possible, operation of heavy equipment on steep slopes (>30% gradients) where exposed soil will readily erode, would be avoided and roads and landings would be located on level ground. Exposed soil on steep slopes would be stabilized during and after use to control erosion. See Appendix E, Table E5, G18, G19a and G19b). There would be no short or long-term detrimental soil disturbance effects from soil erosion on project sites or adjacent areas, when Forest Plan soils and transportation system guidelines are followed. There would be short-term detrimental effects from soil displacement on the project sites where landing areas or temporary roads require clearing of stumps, rocks and other debris. No treatment areas or adjacent areas in the Park Falls Hardwoods project would incur long-term impairment of the soil resource from erosion or displacement, should Alternatives 2-5 be implemented.

Soil Productivity: The potential for activities in Alternatives 2-5 to impact inherent soil productivity of the proposed treatment areas is low. Soil productivity could be reduced from the proposed activities if excessive organic matter and nutrients were removed through harvesting, soil erosion, or displacement. Productivity could also be reduced if soil physical properties such as structure or porosity, were impaired by compacting or rutting soil beyond acceptable limits for a treatment area (USDA Forest Service, 2005c, p 5-13). Potential for soil impacts from compaction, rutting, erosion, or displacement is estimated to be low, as described in the two previous sections, and the proposed actions will not adversely affect the inherent productivity of the soil resource in the treatment areas.

Alternatives 2-5 propose to harvest a total of 8722, 8969, 14,366, or 17,024 acres, respectively, to increase stand health and vigor, and address other Park Falls Hardwoods project area needs as described in Chapters 1 and 2. The Park Falls Hardwoods project does not prescribe whole-tree (bole plus crown) or biomass (tree crown) harvest, but would allow such operations if requested by the timber purchaser on 854, 1045, 1217, or 16,984 acres in Alternatives 2-5, respectively. Alternatives 2-4 allow for biomass removal (whole-tree) only within non-hardwood stands. Alternative 5 allows whole-tree biomass removal within all non-hardwood stands and tipwood only biomass removal within all hardwood stands. It should be noted that while there is a potential emerging interest in wood-based bio-energy in northern Wisconsin, to date the demand for woody biomass from the CNNF has been very low, accounting for less than 3% of the annual total wood volume harvested from 2007-2010 (St. Pierre et al. 2011).

Cutting trees and removing the merchantable bole or whole-tree (bole plus crown) would remove a portion of the treatment area organic matter and nutrients (N, P, K, Ca, and Mg). The ratio and amount of nutrients in tree components (e.g. foliage, branches, bole, bole bark, stump and roots) and thus, the amount removed, varies by species, age, stocking and site quality. Alban et al. (1978) determined the organic matter and nutrient distribution in vegetation and soil for aspen, white spruce, red pine and jack pine on the same soil type in northern Minnesota. They found most nutrients are concentrated in the soil, with only 6-23% of the N, Ca, and Mg, and only 21-50% of the P and K found in the vegetation (includes a small percentage of each nutrient in the understory vegetation). Perala and Alban (1982, p 184) found the species order of nutrients in trees on both a loam and sand soil to be aspen>spruce>red pine>jack pine for all nutrients, except red pine>spruce for Mg. Oaks are similar to aspen in accumulating relatively large amounts of nutrients, especially calcium (Johnson and Todd 1987, p 101). Pastor and Bockheim (1994. p 348) found nutrient concentrations in aspen to be higher than mixed hardwoods (sugar maple) on the same soil in Vilas County, Wisconsin. About 50-60% of the above ground tree nutrients for both hardwoods and conifers are in the bole, of which half is in the bole wood and half in the bole bark (Alban et al. 1978, p 294, Mann 1988, p 415). Nutrient removal from merchantable bole and bark harvest is not considered excessive, as these nutrients can generally be replaced by mineral weathering and atmospheric deposition (Silkworth and Grigal 1982, p 626). Also, harvest areas retain nutrients in; forest floor organic materials (humus layers); mineral soil nutrient capital; tree stumps, decaying root systems, and existing fine and coarse woody debris; top wood stem, foliage and branches (slash), remaining trees (if thinning); shrub and herb layer; and in the 10-15% or more of tree biomass that is not removed due to breakage during harvest (Alban and Perala 1990, p 386; Grigal 2004, p 14-22). Whole-tree harvesting removes about 1.75 to 2 times the nutrients of a bole only harvest (Alban et al. 1978, p 294; Federer 1989, p 597; Grigal 2004, p1 7) and would be a long-term productivity concern on coarse textured, nutrient-poor sites (Perala and Alban 1982, p 191; Grigal 2000, p 179), with the most concern for calcium depletion, followed by K and Mg to a lesser extent (Wilson and Grigal 1995, p 1755; Grigal 2000, p 174; Federer 1989, p 599). Leaching of nutrients below the rooting zone occurs naturally and would be increased for a short time following the disturbance of whole-tree or bole only harvesting. Silkworth and Grigal (1982, p 630) found leaching losses of N, P, K, and Mg to be less than inputs by precipitation and weathering, with small losses of Ca that were greater than inputs for the first 5 years following whole-tree aspen harvesting in northeastern Minnesota. Stone et al (1999, p 182) recommend limbing at the stump and retaining of slash on site to maintain productivity when harvesting aspen on sandy soils.

All LTP/soil map units on the CNNF have been evaluated for potential to allow biomass (tree crown and branches) removal based on specific soil physical, chemical and biological characteristics. The Forest Plan has a soils guideline to retain logging slash in place (limbing at the stump) where topsoil is less than one inch thick, or where organic matter is less than two percent. This guideline is intended to protect long-term productivity of coarse sandy soils with low nutrient reserves. Soils that meet these criteria are identified in the CNNF landtype phase (LTP-soils) database and no biomass removal is allowed on these soils in any alternative (Appendix E, Table E5, G16). In addition, the Wisconsin Department of Natural Resources (WDNR) recently developed Forestland Woody Biomass Harvesting Guidelines (Herrick et al. 2009) with the guideline “Do not harvest fine woody material on dry nutrient-poor sandy soils”, with jack pine stands as an exception. The CNNF LTP database also identifies and assigns a “NO” rating to the soil types restricted from biomass harvest based on the state criteria for nutrient-poor sand soils with <3% clay content in the upper 40 inches, which has been correlated with low Ca, K, and Mg content.

All of the harvest areas proposed for biomass removal in Alternatives 2-5 have soil characteristics that are acceptable for whole-tree removal based on the CNNF soils guidelines and Wisconsin's woody biomass harvesting guidelines. All harvest areas proposed for optional biomass removal in Alternatives 2-5 have specific soil/site characteristics that would not present a concern for long-term soil productivity, but would require retaining 10% of the tree crowns plus breakage and existing down woody material during each harvest entry to fully comply with the Wisconsin woody biomass guidelines (Appendix E, Table E5, M16a and M16b).

Soil respiration (SR), also referred to as soil-CO2 evolution or soil-CO2 efflux, is the total CO2 production/release in intact soils resulting from the respiration of soil organisms, roots, and mycorrhhizae, and is a major flux in the global carbon cycle (Raich and Schlesinger, 1992, p 81-82). This activity is sustained by organic matter inputs to soil from above (surface litter) and below ground (root detritus), with annual soil respiration rates primarily controlled by seasonal soil temperature and soil moisture, among vegetation types at the landscape scale (Zheng et al., 2005, p 170). Removal of merchantable tree boles or whole trees (bole plus crown) will affect soil respiration rates and carbon uptake following treatments proposed in Alternatives 2-5, but would be expected to return to pre-treatment levels as studies suggest, without detrimental effects to the long-term productivity of the land or to the carbon balance of ecosystems from a local to global scale.

Soil organic carbon was also assessed in the Forest Plan FEIS (p 3-39, 3-84, 3-93), which indicates through the literature cited that the CNNF would continue to be a carbon sink (little to no change in soil carbon could be expected after all types of forest harvesting proposed) and projects an increase in soil carbon storage through implementation of the Forest Plan. More recent studies specific to Wisconsin forests indicate the CNNF to be a net sink of carbon, even after accounting for all associated emissions (Gower and Ahl. 2006, p 50). Ten year results from a North American long-term soil productivity experiment, with harvest plots in Minnesota and Michigan, indicate when forest floors are retained there is no general decline in soil carbon with time, slash removal does not reduce soil carbon storage to 30 cm through 10 years, and the primary inputs to soil carbon come from the decay of fine roots that remain from the harvested stand, not the logging slash (Powers et al., 2005, p 44-45). Soil organic carbon would be increased initially on all harvest treatment areas for Alternatives 2-5, due to the decaying root systems of the harvested trees.

Natural soil formation processes would continue, biomass and organic matter would accumulate from the open lands and managed forest vegetation and be incorporated into the soil surface, and the biological and geo-chemical nutrient cycles would continue. Inputs to the system include atmospheric deposition and weathering of mineral soil parent materials. Annual nutrient balances based on estimated inputs and outputs would tend to increase as succession progresses (Pritchett and Fisher, 1987, p 190).

Alternatives 2-5 would have no long-term direct or indirect detrimental effects to soil productivity. Long-term productivity would be maintained on more than 98% of all treatment areas.

Summary: The effects of implementing one of the proposed Alternatives 2-5 when added to the effects of past, present, and reasonably foreseeable actions would not be expected to result in appreciable adverse cumulative effects to the quality of the soil resource in the project area. See Table 34, below. More than 99% of the proposed treatment areas are currently in good condition and soil properties are well within their natural range of variability. Soils on project sites pose a low risk potential for detrimental disturbance from the conventional ground-based logging and transportation system activities proposed. The project would adhere to Forest Plan standards and guidelines and resource protection measures for specific soil types, eliminating or minimizing potential adverse soil resource impacts. At most, an additional 1-2% of the soil resource in the treatment areas would sustain long-term detrimental impacts from proposed activities. The primary soil resource related difference among Alternatives 2-5 is the number of acres proposed for timber harvest, because the amount of detrimental soil compaction predicted is directly proportional to the acres harvested. While the acres of optional biomass removal and road construction/reconstruction/decommissioning differ by alternative, there would be no appreciable direct or indirect effects to long-term soil productivity from these activities. More than 98% of the treatment areas in Alternatives 2-5 would remain in a non-detrimentally disturbed condition, which meets National and Regional soil quality standards. Based on minimal direct and indirect effects on soil compaction, rutting, erosion, displacement, or productivity, Alternatives 2-5 would not impair the long-term

productivity of the areas proposed for treatment or adjacent areas. This determination is based on the best available science; including literature reviews, peer reviews, and ground-based observations.

Table 34: Summary of Direct/Indirect and Cumulative Soil Detrimental Disturbance by Alternative

Soil Resource Impact	Alternative 1 Acres (%)	Alternative 2 Acres (%)	Alternative 3 Acres (%)	Alternative 4 Acres (%)	Alternative 5 Acres (%)
Total treatment area	0	8722	8969	14366	17024
Direct and indirect long-term detrimental disturbance (predicted)	0	97 (1)	100 (1)	154 (1)	182 (1)
Past detrimental disturbance	102 (<1)	52 (<1)	54 (<1)	86 (<1)	102 (<1)
Cumulative detrimental disturbance	102 (<1)	149 (2)	154 (2)	240 (2)	284 (2)
Long-term productive soil resource	16922 (>99)	8573 (98)	8815 (98)	14126 (98)	16740 (98)

Aquatic Resources

Issue 6

The water quality of lakes and streams could be negatively affected as a result of forest management activities if sedimentation were to occur. Erosion is the process by which soil particles are detached and transported. Erosion resulting from natural causes is referred to as geologic erosion, while that caused by human activities is commonly known as accelerated erosion (Hewlett and Nutter 1969). Erosion can be caused from water, wind, and gravity. In Wisconsin, water is the most common erosive agent, particularly in forested areas. When eroded material is transported and then deposited by water or wind, it is referred to as sediment and the process as sedimentation. Sediment yield is the amount of sediment transported from an area, usually from a watershed via a stream. Fine sediment is a particular water quality problem in streams because it can reduce: (1) available habitat by filling pools; (2) survival of fish eggs and fry; and (3) survival, composition and abundance of aquatic invertebrates (Waters 1995; Cordone and Kelly 1961). Sedimentation can also affect channel morphology by increasing width/depth ratio and reducing sinuosity (Rosgen 1994). Sand sediments in particular are associated with increased width and reduced depth (Heede 1980).

Potential effects on fisheries could occur as a result of changes in water quality or loss of habitat through direct stream disturbance or removal of potential sources of large woody debris. Aspen regeneration immediately adjacent to the stream (within 300 to 450 feet) could have an indirect effect on the streams by encouraging beaver colonization which can affect water temperature, sediment transport, and channel morphology. Increases in water temperature of streams and small ponds can occur when the shade that adjacent vegetation provides to the water body is completely removed. The additional sunlight can warm the water by a few degrees, which can cause cold-water communities (that may already be in trouble) to be negatively affected.

Information for the aquatic impact analysis has been summarized from the Project File (PF), Water Resources Report for the Park Falls Hardwoods Project, and supporting files.

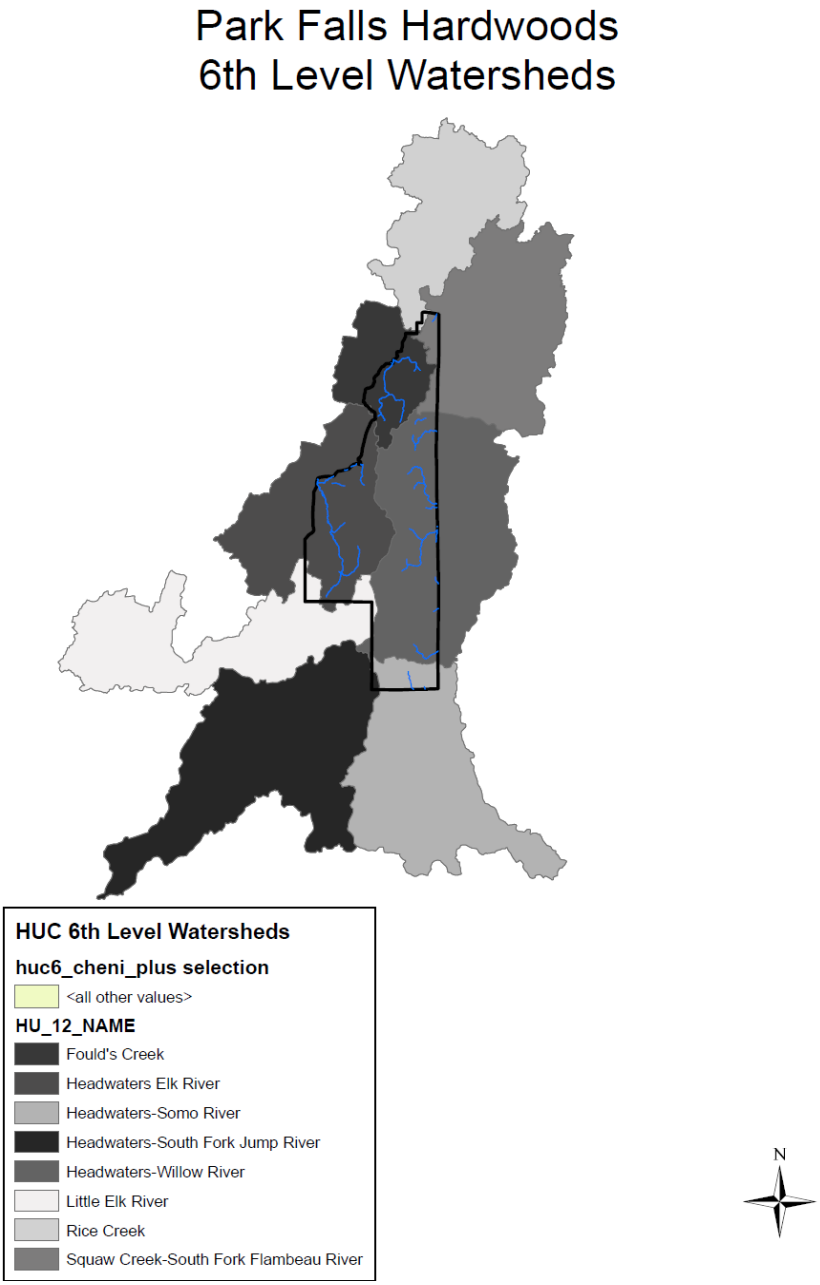
Affected Environment / Area

Sediment yields in Wisconsin range from a high of 100-500 tons/sq mi/yr to a low of less than 10 tons/sq mi/yr (Hindall 1976; Hindall 1972; Hindall and Flint 1970). The highest sediment yields occur in the hilly terrain with mixed forest and agriculture in the southwestern part of the state and the red clay region near Lake Superior. The lowest yields occur in the forested areas of northern Wisconsin including the CNNF. These low yields occur for three reasons. First erosion and sediment yield from timber harvest areas is usually low because ground cover is often provided by residual vegetation, logging slash and rapid re-growth of vegetation (Very 1972; Spangenberg and McLennan 1983). Second, timber harvest and other forest management activities typically only impact a small portion of the area in any given year. For

example, on the CNNF, timber harvest has occurred on 1.6 percent of the land each year over the last decade (USDA Forest Service 1998). Third, even when erosion does occur it frequently is not delivered to streams because of the low relief and undulating terrain (Verry 1972).

The Park Falls Hardwood area lies within eight 6th level Hydrologic Unit Code (HUC) sub-watersheds (Figure 11).

Figure 11: 6th HUC Level Watersheds in the Park Falls Hardwoods Project Area



On average, all delineated 6th level watersheds encompass approximately 10,000 to 40,000 acres. National Forest ownership within the eight 6th level watersheds ranges from. <1% to 96%. National Forest ownership is important because it determines the degree of influence the CNNF will have in any

particular watershed (Forest Plan, FEIS p 3-5). Table 35 summarizes the ownership of the eight 6th level watersheds within the Park Falls Hardwoods project area.

Table 35: Summary of Ownership, 6th HUC Level Watersheds

	Rice Creek	Squaw Cr / SF Flambeau River	Foulds Creek	Elk River	Willow River	Little Elk River	SF Jump River	Soma River
Total Watershed Area (acres)	21748	29701	11404	25917	36967	27677	39503	31361
CNNF Acres in Watershed	7943	3560	10995	18689	16108	1284	144	2294
% CNNF Ownership	36	12	96	72	44	5	0.4	7

Table 36 gives additional ownership information about each of the 6th HUC level watersheds. Even though the CNNF manages only small portions of most of the 6th level watersheds, there are some exceptions (Foulds and Elk). Also, within the portion of the watershed that falls inside the Park Falls Hardwoods boundary, ownership is a majority public land, forested, and non-developed. Table 36 includes the streams within the Park Falls Hardwoods project area and which watershed they fall within along with the acres of streamside riparian zones for each 6th level watershed within the project area.

Table 36: Other Information, 6th HUC Level Watersheds

	Rice Creek	Squaw Cr / SF Flambeau River	Foulds Creek	Elk River	Willow River	Little Elk River	SF Jump River	Soma River
% CNNF Ownership in Watershed	36	12	96	72	44	5	0.4	7
% CNNF Ownership in Portion Within Project Area	99	94	100	99	90	99	96	98
Named Streams in Project Area	None	Unnamed Stream	Foulds Cr, Sievers-on Cr	Spring Cr, Elk River	Willow, Little Willow, Stony, & Thunder Creeks	None	None	Scott Cr
Riparian Area Within Project Area (100' stream buffer) - acres	0	4	171	307	356	0	0	29

A variety of stream types occur within the project area. Streams within the Forest have been classified using two classification systems; Wisconsin Department of Natural Resources (WDNR) Trout Class and the Chequamegon-Nicolet Stream Classification System. Table 37 lists the streams and their classification types along with other management information.

Table 38 includes narrative information about each stream. As a summary, there are five classified trout streams within the project area, they include: Foulds, Sieverson, Elk River, Spring Creek and Little Willow. WDNR has classified Thunder Creek as Class III. Forest Service data indicates that Thunder does not support brook trout. Willow spring pond is also classified trout water.

There are no lakes within the project area.

Table 37: Stream Classification and Management Direction					
Stream	**CNNF Stream Classification**	**WDNR Trout Class**	**No Aspen Zone**	**Beaver Control**	**Total Stream Mileage**
Elk River	NLCg/NLOg	II	450	Y	8.0
Spring Creek	NAC/NLCg	I	450	Y	3.9
Foulds Creek & Pond	NLCg/NLOg	I	450	Y	5.9 5.5 ac pond
Sieverson Creek	NLCg	I	450	Y	1.9
Unnamed Tributary to Foulds	NSO		450	Y	
Willow Creek & Springs Creek	NLWg	III		Y-springpond	6.9 3.4 ac pond
Little Willow Creek	NLWg	II	300	Y	3.3
Unnamed Tributary to Little Willow Creek	NLOg	I	300	Y	.8
Stony Creek	NLW		300	Y-trib to lt willow	4.2
Thunder Creek	NLW	III		N	2.6
Scott Creek	NSW			N	1.2

Table 38: Stream Information on Fishery		
Stream	**Trout Class**	**Narrative**
Elk River	II	Supports native brook trout. System is currently part of the beaver management program on the Forest. The system has water temperature issues as well as instream habitat problems which are a result of prior land management activities. No stocking occurs within the system.
Spring Creek	I	Important coldwater tributary to Elk River. Is part of the beaver management program. No stocking occurs.
Foulds Creek & Pond	I	Highest quality brook trout water on the District. Part of the beaver management program. There is a dam on the outlet of the spring pond. Creek has received various instream habitat improvement projects over the years with the most current activity in 2008. No stocking occurs.
Sieverson Creek	I	Important coldwater tributary to Foulds Creek. Is part of the beaver management program. No stocking occurs.
Unnamed Tributary to Foulds		
Willow Creek & Springs	III	Spring ponds support brook trout. Brook trout a minor component in Willow Creek. Pond has been stocked in the past but no stocking in recent history.
Little Willow Creek	II	Native brook trout fishery. The stream was recently added to the beaver management program. Due to past management activities the stream has issues with water temperature and instream habitat. No recent stocking activity.
Unnamed Tributary to Little Willow Creek	I	Important groundwater tributary to Little Willow. No stocking.
Stony Creek		Warmwater stream that supports minnow species.
Thunder Creek	III	Warmwater stream that supports minnow species. WDNR has it classified as Class III trout water. It is documented that the creek ran dry during 2009. The Forest does not consider it trout water.
Scott Creek		Warmwater stream that supports minnow species.

According to the Wisconsin Department of Natural Resources (1993) wetland coverage map, there are a total of 11,422 acres of wetland occurring on National Forest lands within the Park Falls Hardwoods project area. This does not include all of the small isolated wetlands within the project boundary. Some wetlands are very small and they are not easily identified. Approximately 59% of these acres are considered forested wetland with 40% in shrub type. Wetlands are those areas that are inundated by surface or ground water with frequency sufficient to support, under normal circumstances, vegetation or

aquatic life that requires saturated or seasonally saturated, soil conditions for growth and reproduction (Forest Service Manual - FSM 2527.05).

Riparian ecosystems are the transitional area between the aquatic ecosystem and the adjacent terrestrial ecosystem. It is identified by soil characteristics and distinctive vegetation communities that require free or unbound water (FSM 2526.05). Aquatic ecosystems are the stream channel, lake, or estuary bed, biotic communities, and habitat features that occur therein.

The affected area for analysis of direct and indirect effects of the alternatives to the aquatic resources is all of the 6th level watersheds that lie within the project boundary.

Cumulative Impact Boundary

Sediment movement downstream can be variable and dependent upon the landform characteristics; therefore, the cumulative effects area for aquatic resources encompasses the 6th level watershed boundaries that lie within and outside the project area. These boundaries were chosen because this watershed size will provide the most comprehensive boundary when analyzing the cumulative effects to water quality from timber harvesting, road building, and road decommissioning. The time span for the cumulative effects analysis for aquatic resources defines long-term effects as those expected to last longer than 1 year after treatment or mitigation is completed, while those expected to last less than 1 year were considered short-term. Short term effects would be expected to occur during the first growing season or the time it takes the exposed soil to become stabilized and re-vegetated. Long term effects would be expected to occur in subsequent growing seasons, where the short term effects were more prominent on the landscape and it will take longer for the sediment to flush downstream.

Past and Reasonably Foreseeable Actions

The Elk River was used for log drives at some point between the mid-late 1800's through early 1900's. Remnants of old logging dams can be found on the river. River cleaning (for log drives) would have removed all large woody debris (LWD) from the river within the project area along with any rock obstructions. In addition, timber harvest of riparian areas would have removed future sources of LWD from the banks of the river until 1986 when standards for retaining future sources of LWD were in place.

Many of the roads within the area have been in place since the early logging era. Over the years, the road mileage has increased but it is still based on roads located during the early logging era. It has contributed to changes in drainage patterns, increased sediment loads, fish passage problems, and loss of riparian habitat (Forest Plan FEIS, p 3-32). Poorly designed, located, constructed, or maintained roads and trails can be significant sources of stream sediment. Roads and trails with undersized culverts that fail frequently are considered the largest sources of sediment in streams because failure typically produces several tons of sediment and the entire volume is delivered to the stream. Since 1998 there have been several road stream crossings replaced/repaired and/or decommissioned within the aquatic resources cumulative effects area. The existing culverts had been poorly designed and were replaced with properly sized culverts that allowed for fish passage and significantly reduced sediment input. A one mile stretch of FR 517 was also decommissioned. This project removed six poorly placed crossings on spring creek.

Foulds creek and spring pond have a history of habitat restoration work. In the early 1990's a new whistle tube control structure was installed at Foulds Spring Pond. The creek has received various instream habitat restoration treatments since the mid 1980's.

Past vegetation management within the 8, 6th HUC level watersheds would be accounted for in data used for the analysis. There has been limited vegetation management in the project area over the last 20 years.

The future/ongoing vegetation management activities that are located within the cumulative effects area include: A portion of the Early Successional Habitat Improvement project (Elk River watershed); a portion of the Riley Wildlife Management Area project (1 acre portion of an opening in Foulds watershed). Road surface, ditch, and embankment erosion and occasional culvert washouts are occurring at 4 stream crossing sites, resulting in sedimentation of the streams. Fish passage is also a concern. Replacement of culverts is an ongoing part of system road maintenance and would be occurring at the four identified crossings in the foreseeable future.

Measures

All harvest treatments and road projects within the Riparian Management Zone or within wetlands will be used to estimate the potential for impacts to the aquatic systems.

Direct/Indirect/Cumulative Impacts

Table 39 shows some measures and results for potential areas of direct and indirect impacts to the aquatic resource for each alternative. In Alternatives 4 and 5, less than 2% of the forested wetlands would have any potential impacts. In Alternatives 2 and 3, less than 1% of the forested wetlands would have potential impacts. The largest impact across Alternatives 1-5 would be from decommissioning roads within the wetlands. Decommissioned roads would be stabilized and would not be adding to wetland impacts. In Alternative 1, decommissioning would not occur so any impacts from the roads would continue.

In all alternatives, impacts to wetlands and water quality are similar. There are some harvest treatments that were proposed in forested wetlands for reducing the threat from emerald ash borer (EAB). Proposed EAB treatments would be monitored during project implementation to ensure contract specifications and design features are followed. Selected treatment areas would be monitored by interdisciplinary teams to evaluate whether ground conditions meet acceptable limits of change. If project design features are followed, no long-term detrimental water quality effects would be expected to occur from sedimentation or lateral sub-surface flow in wetlands in any alternative. Table E5, Appendix E of this document provides a complete list of mitigation measures. Tables F2 and F3, Appendix F provide a list of applicable measures for each individual treatment area. The PF, Aquatic Resources Report for the Park Falls Hardwoods Project, includes additional information on the effectiveness of the measures used to eliminate or reduce impacts to the aquatic resource.

If Alternative 1 were implemented, up to 25 acres of the aspen habitat along classified trout streams would remain a favorable food source for beaver, potentially leading to vegetation removal. Removal of vegetation along riparian areas from beaver activity has the potential to increase water temperatures as well as reduce soil and bank stability creating an increase in sediment transport and impacting the overall stream channel morphology. Roads that are hydrologically connected to wetlands and streams would not be decommissioned in Alternative 1. These roads may contribute sediment or alter the hydrologic function of the connected wetlands and streams.

Table 39: Acres and Miles of Treatments in Wetlands and Riparian Management Zones

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Harvest Acres in Forested Wetlands (out of 7110 acres)	0	0	50	117	117
Road Construction (miles) in Wetlands	0	0	0.1	0.1	0.1
Road Reconstruction (miles) in Wetlands	0	0.4	0.4	0.4	0.4
Road Decommissioning (miles) in Wetlands	0	0.7	0.7	0.7	0.7
Acres of Tree Bole Harvest in Water Body RMZ (out of 867 acres)	0	68	68	65	86
Biomass Harvest in RMZ (out of 867 acres)	0	18	18	18	81
Road Construction (feet) in RMZ	0	0	0	0	0
Road Reconstruction (feet) in RMZ	0	121	121	121	121
Road Decommissioning (feet) in RMZ	0	591	591	591	591

It should be noted that many of the stands have less than one tenth of an acre that falls within the 100 foot RMZ. It is highly likely that when crews lay out the harvest boundaries, those RMZ's will be avoided.

No long-term detrimental water quality effects would be expected to occur from sedimentation, water temperature increases or lateral sub-surface flow in wetlands when the project design features are followed and because of the nature of the project locations. Overall, the proposed harvest treatments within the riparian corridors would help to achieve Forest Plan goal 1.3e, Improve or restore aquatic/ riparian habitat in streams and lakes (Forest Plan, p. 1-3).

In summary: Alternatives 2-5 have a range of 65-86 acres that fall within the RMZ with Alternative 5 having the most. The difference is an additional selection harvest in Alternative 5. Alternatives 2-5 have only 6 stands proposed for aspen/paper birch treatments that fall within the Aspen No Regeneration zones (for trout streams). Total acreage of those stands that fall within the zone is a tenth of an acre or less. It is likely that those zones would be avoided based on the applicable standards and guidelines. Biomass treatments in Alternatives 2-4 have approximately 18 acres that fall within the RMZ. In Alternative 5 the RMZ acreage increases to 81 acres. Alternatives 4 and 5 have 117 acres of proposed lowland hardwood treatments. Alternative 3 has 49 acres and there are no lowland hardwood treatments in Alternative 2. The amount of road construction, reconstruction and temporary construction through wetlands is the same for Alternatives 2-5 and amounts to about .45 miles. Alternatives 2-5 have approximately ¾ mile of roads that crosses through wetlands proposed for decommissioning as well as 590 feet in the RMZ. Overall, the proposed harvests within the riparian corridors, which include selection harvest, commercial thinning, improvement cuts and various underplantings, would help to achieve Forest Plan goal 1.3e, and would improve or restore aquatic/ riparian habitat in streams and lakes (Forest Plan, p. 1-3).

Transportation

Issue 7 / Objective 14

This section of Chapter 3 discloses the effects of attaining the objective of the purpose and need which is to build and maintain a safe, efficient, and effective infrastructure (transportation system) that supports public and administrative uses of National Forest System lands. And to retain and progress toward the Forestwide average total road density desired upper limit of 3.0 miles per square mile established in 1986. Information for the transportation analysis has been summarized from the Project File (PF), Transportation Resource Report for the Park Falls Hardwoods Project, and supporting files.

Affected Environment / Area

In order to improve the opportunities for a variety of recreation experiences, reduce impacts on streams, and reduce effects on some wildlife species, it is necessary to reduce the average total and open road density (Forest Plan, p 1-7) from 2004 levels. Upper limits for open and total road density have been set in the Forest Plan and vary by Management Area (Forest Plan, p. BB-1). These upper limits aren't goals, but are designed to otherwise focus management efforts on decreasing over-all road densities.

The national transportation policy adopted in 2001, provides overall guidance and direction for National Forests to assess road-related access needs, identify opportunities and priorities for future management of the classified road system. A desirable transportation system provides safe access and meets the needs of local communities and forest users; facilitates the implementation of the Forest Plan; allows for economical and efficient management within likely budget levels; meets current and future resource management objectives; and has a minimal impact on natural resources. (Forest Plan, pp.1-7, 2-35-38). Although the final roads rule is extensive in providing a comprehensive approach to transportation systems, it did not address the use of off highway vehicles (OHVs). Further complicating matters, policies vary from state to state and between National Forests. In 2005, in response to the need for development of a consistent national policy, the Forest Service published the Travel Management Rule (TMR), a new rule for providing motor vehicle access to National Forests and Grasslands.

The final Rule (2005) required each National Forest and Grassland to designate those roads, trails, and areas open to motor vehicle use. Designated routes and areas are identified on a motor vehicle use map (MVUM). As a result of TMR implementation, the open road densities displayed in this report have been calculated in two ways: Based on the LRMP open road mileage baseline (that includes the unauthorized and system roads that are physically open on the ground but not legally open) and based on the Forest Plan definition for open road density, relative to designated motorized access, and defined in TMR (which

does not include unauthorized and system roads that are physically open on the ground but not open legally on the MVUM).

Currently, the Park Falls Hardwood project area exceeds desired total road density. A road analysis (RAP) was conducted for the Park Falls Hardwoods project area to ensure the forest transportation system was safe and efficient, meets current and future resource management objectives and begins to reverse any identified adverse ecological impacts. The Park Falls Hardwoods road analysis (Project File – RAP Park Falls Hardwoods Project) identified opportunities for decommissioning unneeded roads, and closing roads only needed for intermittent access that have soils that are easily eroded or rutted, have other resource conflicts, or show evidence of little to no use by the public. The road analysis also identified opportunities to add unauthorized roads to the transportation system as either open or closed to the Forest Service and public. Roads that would be closed to the public would be open to the Forest Service for administrative use as needed (e.g. for access to timber harvest units). In some cases new construction was identified as needed to best facilitate long-term timber management access, due to the spatial arrangement of existing roads.

Specific to the CNNF, historic logging operations and homesteaders developed a number of roads comprising the existing road system before land was first purchased by the government in the 1930s. 1933 is when the Chequamegon National Forest was originally proclaimed by Congress. Some of these old road corridors were utilized repeatedly over the years for a variety of uses and were slowly reconstructed or constructed to form our present road situation. The road system was also expanded by the Forest Service over the years to meet National Forest management objectives.

Another two-fold situation that added to expansion of the road network was an open unless posted closed off road vehicle (OHV) use policy on the Forest prior to 2004, combined with a substantial increase in OHV use during the preceding two decades. Frequent travel by off road vehicles on roads designated as temporary travelways prevented re-vegetation of temporary corridors and perpetuated their use as roads. Because of this activity it became more difficult to effectively decommission temporary roads. In 2004 the CNNF specifically addressed OHV use on the Forest and eliminated the open unless posted closed policy.

The Park Falls Hardwood area encompasses approximately 60 Square miles (approx. 38,600 acres) of National Forest ownership. The existing total road density is 3.15 miles per square mile.

Prior to implementation of the Travel Management Rule (TMR), there were about 96 miles of these Forest Service roads open to the public, resulting in an open road density of around 1.60 miles per square mile. Following implementation of TMR, and the publication of a Motor Vehicle Use Map (MVUM) in January 2009, the miles of roads within Park Falls Hardwood project area open to public motorized use was reduced to approximately 63 miles, or 1.04 miles per square mile. Consequently 33 miles of roads are no longer available for motorized use on the MVUM, yet remain physically open.

The bounds of the analysis for determining direct and indirect effects will be the Park Falls Hardwoods project area. The rationale for using the described boundary is that, upon preliminary analysis, it was found that all action alternatives would have neutral or beneficial effects in moving the Park Falls Hardwoods area toward the road density objectives set as thresholds and given in the Chequamegon-Nicolet Forest Plan. Since the proposed activities would not move the Park Falls Hardwoods project area away from these objectives, it was not necessary to examine the area in a larger context.

Cumulative Impact Boundary

Although the boundary of analysis for direct and indirect effects is essentially the project area, the boundary for cumulative effects is the entire west side of the Forest. This involved reviewing other ongoing activities, and other proposed activities relative to transportation systems on the three west-side Districts (Medford-Park Falls, Great Divide, and Washburn). By reviewing other planned and ongoing projects on the Chequamegon land base, one can quantify whether the west side of the Forest as a whole, is moving toward Plan goals. The East side of the Forest, or more commonly known as the Nicolet land base was not included due to geographic displacement relative to the Chequamegon land base.

Past and Reasonably Foreseeable Actions

A network of logging railroads developed for logging of the project area during the late 1800's and early 1900's was the first transportation system developed. Portions of this network are still visible today and include primary as well as unauthorized roads within the project area. Subsequent historic logging operations and homesteaders developed some of the existing roads in addition to railroad grades before land was first purchased by the government in the 1930s. The road system continued to expand through the 1980's to meet management objectives for the National Forest. Another situation that added to the current road network was the increase of off road vehicle use in the last two decades. Frequent travel by off road vehicles on roads designated as temporary travel-ways prevented re-vegetation of the corridors and perpetuated their use as roads.

There are currently no ongoing road management activities taking place within the Park Falls Hardwoods project area other than road maintenance activities. Other current activities considered for cumulative effects are road activities currently taking place on the Chequamegon landbase (Twenty Mile, Fishbone, Cayuga, Camp Four, and Northwest Sands).

The road network within the project area, excepting proposed activities in Park Falls Hardwoods project is for the most part already in place. In addition to planned road management activities described in this document, some additional construction may be needed to access new areas for management activities in the future. Future activities Forest-wide will most likely result in a continued need to construct new roads for timber access i.e. better spatial arrangement for timber management. In conjunction with construction activities, decommissioning will also likely take place, at a higher rate than construction. This is due to the presence of inherited roads and ineffectively decommissioned roads discussed earlier. Specific activities considered are those identified in proposed activities for Twin Ghost and Washburn Redpine.

Measures

Although transportation system changes are typically discussed as of miles of change, a true measure of the effects based solely on road network would be displayed in miles per square mile. This is a universal measure relative to transportation systems and helps illustrate true effects. As an example, 100 miles of road in 2 separate land bases would seem at a glance to be equal in terms of miles of road. If one land base is 100 square miles and the other is only 10 square miles, the density is actually 10 times higher in the smaller area which in turn equates to higher road density and greater effects. In summary, the transportation measures will be miles of road activity as well as road densities, both open and closed to public motorized access.

Road densities are based on ROS (recreation opportunity spectrum) designation and are measured depending on this factor.

Thresholds

The Final Environmental Impact Statement (FEIS) for the Forest Plan was used to set thresholds. Chapter 3-244 of the FEIS defines and measures road density in two ways: Total road density and open road density. Total road density "describes the total miles of all types of roads – including those under the jurisdiction of Local, State, or Federal authorities-per square mile of national forest land". The reason for using National Forest ownership is due to the Forest not being originally established with public domain lands. All Federal lands within the proclamation boundary have been purchased, leaving a checkerboard ownership pattern with numerous privately owned parcels within the boundary. In addition, the FEIS defines "upper limits" which represents the maximum total road density allowed in a specific area based on Recreation Opportunity Spectrum (ROS) designations. These upper limits are considered a goal to be achieved over some length of time. For purposes of this analysis, as long as the trajectory of the road densities are stable, below, or moving towards the maximum (if already above), no threshold has been crossed and impacts from the alternatives would be within those described in the Forest Plan FEIS.

Direct/Indirect/Cumulative Impacts

Table 40 summarizes the transportation system measures by alternative and is reference for the following discussion. Also see Appendix G for maps of the road projects as well as maps that show what the transportation system would be in each alternative. There are also maps for each alternative that show the allowed public motorized access (Motorized Vehicle Use Maps – MVUMs).

The effects of the no action alternative (Alternative 1) are that no transportation related actions would be implemented within the Park Falls Hardwoods project area. No changes or reductions would be realized in total and open road density. The existing condition would by default become the future condition. The total road density would remain 3.15 miles per square mile and the open road density would remain at 1.60 (pre-TMR) or 1.04 (post TMR) miles per square mile. Alternative 1 can be used as a comparison of the other alternatives to the existing condition.

Table 40: Miles of Road Projects and Road Densities in the Project Area

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
ROAD PROJECTS (miles)					
Permanent Construction	0.0	6.3	7.1	11.4	11.9
Temporary Construction	0.0	1.0	1.4	1.4	1.4
Reconstruction and Maintenance	0.0	10.9	14.4	16.8	17.0
Reconstruction (Winter)	0.0	18.2	17.7	22.7	26.2
Decommission	0.0	28.9	30.9	28.9	30.9
ROAD DENSITY (miles per square mile)					
ROS 3/2, MA 2B, Total Road Density – miles per square mile	3.4	3.0	3.0	3.1	3.1
ROS 3/2, MA 2B, Open Road Density – miles per square mile	1.3	1.7	1.7	1.8	1.7
ROS 3/0, MA 2B/6B, Total Road Density – miles per square mile	3.7	3.2	3.1	3.1	3.1
ROS 3/0, MA 2B/6B, Open Road Density – miles per square mile	0.2	0.2	0.2	0.2	0.2
ROS 3/0, MA 2B/NM, Total Road Density – miles per square mile	2.7	2.4	2.3	2.7	2.6
ROS 3/0, MA 2B/NM, Open Road Density – miles per square mile	0.0	0.0	0.0	0.0	0.0
ROS 3/2, MA 8E, Total Road Density – miles per square mile	2.3	1.8	1.8	1.8	1.8
ROS 3/2, MA 8E, Open Road Density – miles per square mile	1.3	0.8	0.8	0.8	0.8
ROS 3/2, 3/0, MA 8F, Total Road Density – miles per square mile	1.3	1.3	1.3	1.3	1.3
ROS 3/2, 3/0, MA 8F, Open Road Density – miles per square mile	0.0	0.0	0.0	0.0	0.0
ROS 3/2, MA 8G, Total Road Density – miles per square mile	2.7	1.4	1.3	1.3	1.4
ROS 3/2, MA 8G, Open Road Density – miles per square mile	0.0	0.0	0.0	0.0	0.0
Project Area Total Road Density – miles per square mile	**3.2**	**2.8**	**2.7**	**2.8**	**2.8**
Project Area Open Road Density – miles per square mile	**1.0**	**1.3**	**1.3**	**1.3**	**1.3**

The effects of implementing Alternatives 2-5 are that the future transportation system would provide the minimum local road system needed that is safe, affordable, has minimal ecological impacts, and would meet immediate and projected long-term public and resource management needs. Objectives would be met through a combination of routine road maintenance, new permanent and temporary road construction, road reconstruction, road decommissioning, conversion of roads to trails, and classification of existing unauthorized roads.

Total road density would be less than 3.0 miles per square mile for the project area and does not differ substantially between Alternatives 2-5. Open road density would decrease or increase from current levels depending on which baseline is compared. Table 40 shows the open road density as an increase in Alternatives 2-5 based on the open road density calculated from the January 2009 MVUM.

In Alternatives 2-5, total road density in the project area would be reduced approximately 12% from 3.2 miles per square mile to 2.8 miles per square mile, and open road density would increase approximately

24% from 1.0 miles per square mile to 1.3 miles per square mile (TMR) in the project area. This increase in open road density actually represents a decrease of about 19% from the 2004 Forest Plan baseline.

Alternatives 1-5 have a total open road density that is reduced from the existing condition at the time of the 2004 Forest Plan.

These patterns of reductions of total and open road densities are similar throughout the project area regardless of the ROS or MA. MAs 8E, 8F, and 8G show the greatest reductions in total road densities.

In MA 2B/6B, open road density would remain constant at 0.15 miles per square mile. Open road density greater than 0 is the result of shared or local government jurisdiction for which the Forest Service has no legal right to close or decommission.

When addressing cumulative effects for transportation one must address all road related activities as a whole rather than individually, as each is interrelated when weighed against the overriding measure which is road density.

Although the boundary of analysis for direct and indirect effects is essentially the project area, the boundary for cumulative effects is the entire west side of the Forest. This involved reviewing other ongoing activities, and other proposed activities relative to the transportation system in comparable management areas on the three west-side Districts (Medford-Park Falls, Great Divide, and Washburn). All ongoing and proposed activities in comparable ROS areas, including Park Falls Hardwoods show net reductions in total road densities. Therefore, the cumulative effects of implementing Alternatives 2-5 in Park Falls Hardwoods project would be a further reduction in total road density already underway on the Chequamegon landbase, and movement toward overall Forest goals for road density.

Open road density on the other hand is more complex in that prior to January 2009 open road densities were calculated using all physically open roads regardless of system status. As of January 2009, and based on National Rule, open road density is calculated using roads authorized for motorized use and displayed on the CNNF 2009 Motor Vehicle Use Map (MVUM). However, the cumulative impact is still a reduction in open road density based on the Forest Plan FEIS published levels, and all alternatives provide continued movement toward overall Forest goals for open road density.

The roads identified for decommissioning in each action alternative are local terminal roads. They have been identified as having detrimental effects based on the Park Falls Hardwoods Roads Analysis or have been identified through field visits to experience little or no use. The individual roads that have been identified for decommissioning have an approximate average length of 0.16 miles. This equates to an average loss in access of 865 feet per road. What is not illustrated by the amount or length of roads decommissioned or constructed is that when implementation is complete, the future transportation system, would provide for an improved spatial arrangement on the landscape.

Road closures differ from decommissioning in that these roads would still be present on the landscape to provide long-term access for management of the National Forest and to protect natural resources, avoid recreation use conflicts, address local government concerns, and/or address safety issues. Closure devices could include gates, berms, rocks, trees, stumps, or other effective means, but would not be installed in Alternative 1.

The addition of newly constructed roads within the project area in Alternatives 2-5 is more than offset by the levels of decommissioning.

As a result of the Park Falls Hardwoods project activities, total road densities within the project area and associated ROS areas are expected to move toward and/or meet Forest Plan objectives. Open road densities meet objectives at the project scale, but exceed upper limits in one ROS/MA area as described above.

Economic / Social Resources

Demand for Wood Products

Issue 8/ Objective 14

Forest Plan Goal 2.5 is to contribute toward satisfying demand for wood products and special forest products through environmentally responsible harvest on National Forest System lands. Commercial harvest is the preferred tool used to meet project area needs when managing vegetation. Most of the activities being proposed to meet the need for action for the Park Falls Hardwoods project would result in the availability of wood products, including pulpwood, sawtimber, and topwood/biomass. The Forest has a demonstrated demand for utilization of these types of wood products so commercial timber harvest would be considered as the primary tool for accomplishment of vegetation treatments, including treatments needed for maintenance and improvements to the road and trail systems.

An economic concern is that counties (and local communities receive a portion of the receipts (revenue from National Forest activities. Timber harvest is the primary producer of federal receipts from National Forests in northern Wisconsin. Alternatives with differing amounts of harvest volume and revenue could economically impact local communities and their ability to provide public services.

Information for this issue / objective has been summarized from the Project File (PF), Economic and Social Resource Report for the Park Falls Hardwoods Project, and supporting files.

Affected Environment / Area

Timber sales offered by the Forest Service and timber harvesting on other public and private lands are important to local communities and local/regional economies. The timber resources directly provide local jobs and income through the harvesting of timber, conversion of timber to wood products, resale of products, and additional jobs within the transportation and service industries that support timber workers. Additionally, portions of federal timber sale receipts may be returned to the counties where timber is cut. In counties with a substantial portion of federal ownership, these payments act in lieu of a private ownership tax base. As an example, Price County received about $429,000 in 2008 from the CNNF.

The forest products industry is the second largest employer in the state of Wisconsin (Forest Plan FEIS, 3-264). According to the Wisconsin Council on Forestry Biennial Report January 1, 2007 – December 31, 2008, direct employment in the forest industry was 68,846 and in 2006 the value of forest product shipments was $20.6 billion. Wisconsin's forest products industries comprise 13.8% of the value added in all manufacturing sectors. Average wages for forest industry jobs are $44,000 annually, compared to the state average of $36,000 and the forest products industry contributes about $3.1 billion per year in wages to the Wisconsin economy (based on 2007 dollars) (Wisconsin Council on Forestry 2010).

The WDNR-Summary of County Economic Sectors, Industry Output, Employment and Employee Compensation shows that the importance of the forest products and processing industry in Price County is more than double the importance in the northern Wisconsin region as whole based on industrial output and employment (WDNR, 2009). From 2005 to the present, Wisconsin has lost 24,000 jobs in all sectors of the Forest Products Industry. Reports and studies have indicated that a lack of secure and available stumpage (wood fiber) is one of the largest contributing factors for these mill closures and associated job losses.

The advance of alternative energy production, including woody biomass, and state mandates requiring utilities to generate portions of their energy portfolios from alternatives could have national social impacts. These impacts are very difficult to place a value on but include; reduced carbon dioxide emissions, improved National security through a reduction on dependence of foreign oil sources, and improved rural economic health. Many challenges still exist in this fledgling industry including securing reliable and consistent supplies of biomass to justify capital intensive infrastructure investments and developing cost effective ways to collect and transport woody biomass. Even with these challenges many companies in northern Wisconsin have begun operating biomass to energy conversion facilities or are in the planning process. Excell Energy's Bayfront power plant, Chequamegon School District Park Falls and Glidden Wisconsin campuses, approximately 11 industrial and residential wood pellet mills, and numerous other cogeneration boilers that provide significant portions of the heat, steam, and electricity used in paper mills

are already in operation. Additional plans are underway to construct an additional 35 mega watt power plant, a first of its kind bio-refinery in the region, and numerous additional wood pellet mills.

Utilization of biomass also responds to the issues of carbon sequestration and climate change. In 2008 the Forest Service Strategic Framework for Responding to Climate Change was released. This document was intended to provide a strategic framework for the Forest Service to guide current and future actions to meet the challenge of climate change. Strategies to address climate change included two main components: Facilitated Adaptation and Mitigation. Mitigation refers to actions to reduce emissions and enhance sinks of greenhouse gases, so as to decrease inputs to climate warming in the short term and reduce the effects of climate change in the long run. "To significantly reduce its greenhouse gas emissions, the United States will need to implement a variety of mitigation strategies, including energy conservation, alternative fuels, clean energy, tree planting, sequestering more carbon in forests, soils, and wood products, product substitutions for more energy-intensive materials, and increased use of energy from wood" (USDA Forest Service 2008e). Biomass harvest as proposed in this project is consistent with Forest Service strategies and policies for addressing climate change.

The spatial boundary used to evaluate direct and indirect consequences of the economic and social environmental impacts are considered to be Oneida and Price Counties because the communities in these two counties would receive the most impact as a result of the Park Falls Hardwoods Project. This is the most reasonable way to estimate impacts since much contextual economic information is gathered and reported at the county level.

Cumulative Impact Boundary

The spatial boundary used to address cumulative impacts is also considered to be Oneida and Price Counties, however surrounding communities in northeast, northwest, and north central Wisconsin are also considered because the majority of logs are hauled to mills outside of Oneida and Price Counties. For the purpose of this analysis, it is assumed that the majority of the economic impact will be realized in Oneida and Price counties. Therefore, the impacts will be estimated for this "two-county" area and put into the next larger context, at the forest, regional and state level.

The timeframe associated with this economic impact analysis will be the present time through the completion of activities proposed in this analysis. Effects to the economic and social environment are not expected to last more than 13 years because that will be the extent of the time period for preparation through termination of Timber Sale Contracts for a project of this size.

Past and Reasonably Foreseeable Actions

There are no current active timber sales in the project area at this time. Recent decisions and upcoming decisions which could contribute to economic impacts and the ability to meet demand for wood products are displayed in Table 9 at the beginning of this Chapter. Across the CNNF, there are 31 other vegetation management projects that are either reaching completion, being implemented, or being planned that could contribute to supplying wood products. From 2003-present, harvest levels on the CNNF have been about 73 MMbf per year or approximately 4% of timber harvested in the state. While it is difficult to predict volumes of timber that would be sold in any given year from the National Forest or from other ownerships, we expect the same trend to continue into the near future. Harvest volumes on National Forest lands are also expected to contribute approximately the same proportion, 2% of the overall harvest volume in Oneida County and 18% in Price County, as in the past.

Measures

A variety of methods exist that can be used to measure the economic effects associated with natural resource management. Some of these effects are easily quantifiable such as the production of sawtimber and pulpwood that result from various management actions. Other values associated with resource management such as ecosystem values, aesthetics, recreation, wildlife viewing and others are more difficult to quantify and this analysis does not attempt to do so. In order to effectively analyze the Social and Economic factors within the Park Falls Hardwoods project area, the analysis focuses on economic efficiency and the direct costs and revenues of managing and harvesting timber that would be expected under each alternative. This analysis provides the decision maker with comparative information on the relative economic effects of the five alternatives.

Indicators that are used to estimate and determine the relative economic and social impacts of the proposal and alternatives to the proposal include: commodity production, income generated, payments to counties and jobs created/sustained. These values are determined based on the volumes and values of projected timber harvests. Jobs created/sustained are used as an indicator of community stability as they relate to lifestyles, economies and local traditions. Estimates of the number of jobs created/sustained and income to local communities were calculated using direct response coefficients derived from Employment and Labor Income Direct Response Coefficients for the US Forest Products Industry (Morgan, et al).

It has been suggested that the Forest Service include an assessment of non-commodity costs and benefits in the economic analysis for proposed projects. Some examples of such non-commodity benefits could include the value of a standing forest in terms of its recreational or aesthetic value, the value of a particular area to birdwatchers or hunters, or the value of an area with no roads present. While the Forest Service recognizes these values, they are not easily quantified or assigned monetary values. It has been our experience that traditional forest management practices (including timber harvesting) have been compatible with the recreation and non-consumptive activities that are popular in the area. This is consistent with the findings of a statewide study that investigated the economic impacts of woodland use for recreation and timber (Marcoullier and Mace, 1999 p ii). Recreational use and tourism has been on the increase in the project area and the Forest Service has not experienced any notable number of complaints related to timber management activities. Given these considerations, the Forest Service is limiting the economic efficiency and impact analyses to those monetary values that are readily available and market-defined. This analysis is not intended to show every highly speculative tradeoff, but, rather to consistently and reasonably compare the costs, revenues, and efficiencies between the alternatives. Also, impacts to non-commodity uses such as recreation, aesthetics, hunting, wildlife viewing, etc. are discussed elsewhere in this Chapter and in Appendix C.

Direct/Indirect/Cumulative Impacts

Table 41 shows the measures for the direct and indirect impacts.

Table 41: Economic Indicators / Impacts by Alternative

	Alt 1	*Alt 2*	*Alt 3*	*Alt 4*	*Alt 5*
Revenue-Cost Ratio for Harvest and Transportation Activities	0:0	.73:1	.72:1	.72:1	.73:1
Sawtimber Harvest Volume (MMbf)	0	6	6	11	14
Pulpwood Harvest Volume (MMbf)	0	37	39	62	71
Total Harvest Volume (MMbf)	0	43.6	45.5	73.2	84.9
Biomass Volume (up to X green tons)[1, 2]	0	3,859	5,964	7,545	30,400
$ Value/Revenue (sawtimber and pulpwood)	0	1,900,064	1,963,892	3,192,061	3,715,370
$ Value/Revenue from Biomass (up to X $)[1, 2]	0	5,788	8,964	11,318	45,600
$ Available to Counties (sawtimber and pulpwood)[4]	0	475,016	490,973	798,015	928,843
$ Available to Counties from Biomass (up to X $)[4]	0	1,447	2,236	2,829	11,400
Jobs Sustained/Created[3]	0	191	198	321	373
$ Income Generated[3]	0	7,675,500	7,974,000	12,874,500	14,953,000

Table 41: Economic Indicators / Impacts by Alternative

	Alt 1	*Alt 2*	*Alt 3*	*Alt 4*	*Alt 5*

MMbf = 1 million board feet

1 Revenues and volume of biomass are determined separately from the expected volume and revenue from more traditional forest products (sawtimber and pulpwood).

2 Biomass revenue and volume is displayed as 100% of the available biomass removed with harvest. Since biomass removal is not required in any alternative, this figure would be the estimated maximum removal in each alternative. It is anticipated that actual biomass removal will fall somewhere in the middle (between none and the maximum figure).

3 Jobs Sustained/Created and Income Generated represents the total number of jobs/income, including full and part time, required to harvest and process timber into finished goods. This does not include jobs/income associated with transporting logs to mills or products to markets.

4 Dollars Available to Counties are based on 25% of gross receipts from timber sales.

In Alternative 1, there would be no short or long-term direct or indirect economic costs or revenues realized as a result of this alternative, there would be no revenues or jobs generated, and no payments to Counties as a result of this alternative.

In all action alternatives, the Revenue – Cost Ratio is about the same (.73 or .72 : 1). This indicates that for about every dollar spent on implementing the harvest and regeneration prescriptions, about ¾ is returned to the National Forest in timber sale receipts. Those costs are also "buying" the non-monetary benefits described elsewhere in this document (such as forest health and resiliency, wildlife, etc.).

Alternatives 2 and 3 are similar in the economic measures (both producing about the same amount of revenue, volume, jobs, and receipts) while Alternatives 4 and 5 are also very similar and close to double the revenues and volumes available in Alternatives 2 and 3.

Alternative 5 is unique out of all the alternatives in the amount of biomass harvest. In Alternative 5, almost all the acres treated with a harvest prescription would be available for removal of the tree tops. The other alternatives limit biomass harvest to non-hardwood areas which is a much smaller fraction of the area than Alterative 5. Alternative 5 has about 6 times the biomass harvest volume than alternatives 2 and 3, and about 4 times the volume of Alternative 4. Based on the recently emerging demand for biomass, this difference may or may not be significant for meeting objectives for meeting demand. Challenges mentioned earlier (securing reliable and consistent supplies of biomass to justify capital intensive infrastructure investments and developing cost effective ways to collect and transport woody biomass) could render Alternative 5 the only viable alternative for biomass production. The other alternatives may have too little to make processing and transporting biomass cost effective.

In 2010, the Medford-Park Falls Ranger District had approximately 21.0 MMbf remaining to be harvested under 9 active timber sales. The remaining Chequamegon-Nicolet National Forest Ranger Districts had approximately 88 MMbf remaining to be harvested. During FY 2010 the Medford/Park Falls Ranger District offered 11 MMbf and the CNNF offered 73 MMbf. Because the District and Forest estimated volume offer per year is independent of any one particular project in the short term, cumulative impacts pertaining to economic efficiency and supply of forest products is not expected to vary by alternative for the next several years. The exception to this would be the No Action alternative (Alternative 1) since it provides no contribution to the overall District or Forest objectives for meeting demand.

In summary, all of the action alternatives (2-5), differ from the existing condition in that they make more timber and biomass available for harvest than currently exists. While Alternative 5 allows for the harvest of 84.9 MMbf and Alternative 2 allows for 43.6 MMbf, the combined CNNF timber sale program is expected to remain within the range of the last seven years of 70-80 MMbf per year. The Medford-Park Falls Ranger District share of this overall program has been 11-15 MMbf per year. Regardless of the action alternative selected it is anticipated that harvest levels will remain steady across the District and Forest as a whole. This means that the expected social and economic effects would remain unchanged from the current condition. Selection of an alternative that provides a higher volume of timber and biomass products would provide additional stability to the District sale program and purchasers of federal

timber and biomass, in that the locations and approximate quantities of the next five plus years of timber sales would be known and all associated environmental analysis would be complete.

Walking Trails

Objective 12

One of the project objectives is to designate and maintain walking trails within the project area and limit the amount of timber harvest in MA 6B to that which can be completed within a 3-year timeframe.

Affected Environment / Area

The Fould's Creek spring ponds have long been utilized as a recreational fishery. The spring ponds have a system of old roads that are no longer utilized for motorized access that could be converted to walking trails, which would provide access to the fishery. Designating a specific access for foot travel would minimize the potential for unwanted impacts to the native trout fishery. Also, there are currently no designated non-motorized trails within the project area. More specifically, the MA 6B portion (semi-primitive, non-motorized) has no designated hiking trails. This area receives use from wildflower viewers, hunters, and other recreationists. Designation of a hiking trail in the 6B area would provide reasonable public access for non-motorized recreation. Also, in the 6B portion of the project area, the Forest Plan calls for completing harvest planned for any decade in a consecutive 3-year period in order to meet acceptable limits of change for semi-primitive recreation settings. For this reason, any proposed harvest within the 6B portion of the project area is limited to the amount of harvest that could reasonably be expected to be accomplished within a 3 year period. See Appendix E, Table E5, G486.

Measures

The measure for this objective is the amount of walking trail designation in each alternative.

Direct/Indirect/Cumulative Impacts

All action alternatives meet the need for non motorized trails within the project area (Table 42). Based on the Forest Plan guidelines for harvest within MA 6B, the semi-primitive character of the MA 6B portion of the project area would be maintained in all alternatives.

Table 42: Walking Trail Designation by Alternative

	Alt 1	***Alt 2***	***Alt 3***	***Alt 4***	***Alt 5***
Fould's Creek Trail	0 Miles	0.8 Miles	0.8 Miles	0.8 Miles	0.8 Miles
Elk River Walking Trial	0 Miles	4.9 Miles	4.9 Miles	4.9 Miles	4.9 Miles

Other Resources and Objectives

Understanding impacts of harvest on the atmospheric flux of carbon dioxide.

Issue / Objective

As mentioned in Chapter 1, one of the objectives for this project is to acquire data on the impacts of selection harvest on the atmospheric flux of carbon dioxide in order to better understand and mitigate impacts of climate change.

Affected Environment / Area

The Chequamegon Ecosystem-Atmosphere Study (ChEAS) is a multi-organizational research effort studying biosphere and atmosphere interactions within northern mixed forest in northern Wisconsin. One of the study sites is within the analysis area and has already collected years of data. Vegetation treatment in the vicinity of the tower allows continuation of the study post vegetation treatment which provides an opportunity to understand the relationship between selection harvest in northern hardwood forests and exchange of atmospheric carbon. The tower location is shown on the Streams and Rivers map in Appendix G. The tower area is surrounded by mature northern hardwood forest which has been identified as needing treatment for other reasons associated with forest health.

The affected area is the area that can be measured with the equipment at the tower (about a 1500 feet radius from the tower location, or about 160 acres around the tower).

Cumulative Impact Boundary

The cumulative impact boundary would be the same as the affected area (within the footprint of the tower).

Past and Reasonably Foreseeable Actions

There are no reasonably foreseeable projects within the affected area. Past thinning of the area occurred, but not in the recent past. Research was conducted on the atmospheric flux of carbon dioxide in this area.

Measures

The measure for estimating the impact is whether or not the stand would be harvested in an alternative.

Direct/Indirect/Cumulative Impacts

In Alternatives 1, 2, and 3, there would be no selection harvest of the area within the footprint of the ChEAS tower. The selection harvest was not included in Alternatives 2 and 3 because it did not meet the criteria used to develop those alternatives. In Alternatives 4 and 5, the selection harvest is included. In Alternatives 4 and 5, the potential for research can continue. The research could provide detailed data needed for carbon cycle and climate change modeling activities. This could allow refinement of forest management activities to better respond to global warming issues. It is unlikely that research of this nature would occur in Alternatives 1-3. Even though there is selection harvest that would occur in the project area or elsewhere, the equipment would need to be relocated and that may be cost prohibitive. Research in a different stand would not have the pre-harvest measurements that have occurred at the Willow tower site, which would limit any benefit of the study.

CHAPTER 4 – LIST OF PREPARERS

This Chapter lists the names and qualifications of the persons who were primarily responsible for preparing this document and the associated analyses and reports. Everyone listed is or was an employee of the Forest Service.

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CHAPTER 5 – DISTRIBUTION OF THE DRAFT EIS

This draft Environmental Impact Statement has been distributed to individuals, other agencies, and organizations that specifically requested a copy of the document or submitted comments on the initial scoping package (proposed action). It was also distributed to certain required federal agencies, federally recognized tribes, and state and local governments.

The following are those agencies, tribes, organizations, or individuals to whom copies of the draft EIS, or notice of availability of the draft EIS on the forest web page, were sent.

Agencies (Local, County, State and Federal)

Director, Park Falls Area Chamber of Commerce	Federal Aviation Administration, Great Lakes Region
Chair, Town of Emery, Price County	Federal Highway Administration
Chair, Town of Fifield, Price County	US Army Corps of Engineers, Great Lakes and Ohio Division
Chair, Town of Worcester, Price County	US Army Corps of Engineers, Mississippi Valley Division
Chair, Town of Lynn, Oneida County	US Navy
Chair, Town of Minaqua, Oneida County	US Coast Guard
Chair, County Board, Price County	US Department of Energy
Forestry and Parks, Price County	USDA, Animal Plant Health Inspection Service
Forestry and Recreation, Taylor County	USDA Forest Service, Institute for Applied Ecosystem Studies
Chief State Forester, Division of Forestry, Wisconsin Department of Natural Resources	USDA, National Agricultural Library
US Advisory Council on Historic Preservation	USDA, Natural Resources Conservation Service
US Environmental Protection Agency	USDI, Office of Environmental Policy and Compliance
US Environmental Protection Agency, Region 5	USDI Fish and Wildlife Service, Green Bay Field Office

Tribes (Tribes and Tribal Agencies / Organizations)

Great Lakes Indian Fish and Wildlife Commission	Lac Courte Oreilles Band of Lake Superior Chippewa Indians
	Lac du Flambeau Band of Lake Superior Chippewa Indians
Ho-Chunk Nation	St. Croix Chippewa Indians of Wisconsin

Organizations / Businesses

American Timberland LLC	Ruffed Grouse Society
Environmental Law and Policy Center	Ruffed Grouse Society, NE Wisconsin Chapter
Great Lakes Timber Professionals Association	University of Wisconsin, Atmospheric & Oceanic Sciences
Habitat Education Center	Wisconsin ATV Association
Louisiana Pacific Corp.	Wisconsin County Forests Association
Price County Telephone Co.	Price Electric Coop., Inc.

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CHAPTER 6 – INDEX

APPENDIX A – GLOSSARY

This appendix includes a list of acronyms commonly used throughout this document, and a glossary of the less common terminology used.

Commonly used Acronyms

BE – Biological Evaluation

BHG(s) – Wisconsin Forestland Woody Biomass Harvesting Guidelines

BMP(s) – Wisconsin's Forestry Best Management Practices for Water Quality

ChEAS – Chequamegon Ecosystem-Atmosphere Study

CNNF – or Forest - Chequamegon-Nicolet National Forest.

EAB – Emerald Ash Borer

EIS –Environmental Impact Statement

DEIS – Draft Environmental Impact Statement

FEIS – Final Environmental Impact Statement

Forest Plan – Chequamegon-Nicolet National Forests 2004 Land and Resource Management Plan

MA – Management Area (from 2004 Forest Plan)

MA 2B – Uneven Aged Northern Hardwoods Management Area

MA 2B/6B - Uneven Aged Northern Hardwoods and Semi-Primitive Non-Motorized

MA 2B/NM – Uneven Aged Northern Hardwoods and Non-Motorized

MA 8E – Research Natural Area (RNA) or Candidate RNA

MA 8F – Special Management Area (SMA)

MA 8G – Old Growth and Natural Features Complex

NEPA – National Environmental Policy Act

NNIS – Non-native, Invasive Species

PF – or Project File – All documents pertaining to the Park Falls Hardwoods Environmental Analysis

RAP – Road Analysis Report

RFFS – or Sensitive – Regional Forester Sensitive Species

TE – Federally Threatened, Endangered, or Candidate Species

Glossary

Alternative – An approach to achieving the purpose and need for action that differs from the proposed action in terms of addressing an environmental issue created by the proposal. Alternatives are usually developed to minimize an undesirable effect of the proposal while meeting the purpose and need. Sometimes they are developed to investigate an alternative approach when other reasonable options exist so that a full range of options is considered.

Canopy –The collective tree crowns in a forest situation forming a layer over the forest floor. A canopy may consist of several layers, depending upon the structure of a particular forest stand. (Forest Plan, page EE-3)

Composition – When used following the term “forest” or “vegetation”: This is the relative proportion, in percent, of the area occupied by a given forest or other vegetation cover type. When provided as desired future proportions in Management Area direction, forest types are typically only to be represented on the upland acres (as indicated in the their respective table headings).

Desired Future Condition – A portrayal of the land and resource conditions that are expected if the Forest Plan goals and objectives are fully achieved. (Forest Plan, page EE-4) A project’s “Need for Action” is based upon changes needed to achieve the desired future condition of a given area in the Forest at a given time.

Early Successional – Pertains to vegetation or habitat that initially colonizes or pioneers a site following disturbance. Early successional communities are dominated by fast-growing, well-dispersed species. Early successional forest types are defined by the Forest Plan (p 3-3) as aspen, balsam fir, paper birch, and jack pine.

Edge – The places where two ecosystems meet; it can also refer to the meeting of two similar communities of differing ages, such as the edge between young aspen and old aspen.

Endangered – In danger of extinction throughout all, or a significant portion, of its range. (Forest Plan, page EE-5)

Environmental Consequences – The direct, indirect and cumulative environmental effects that would result from implementing the proposed action or an alternative.

Even-aged Management – The application of actions that result in the creation of stands in which trees of essentially the same age grow together (Forest Plan, page EE-5). Clearcut, seed tree and shelterwood methods of cutting fall under even-aged management.

Forest Plan – The Forest Land and Resource Management Plan (Forest Plan) is a document that guides all natural resource management activity and establishes management standards and guidelines for a National Forest, embodying the provisions of the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended by the 1976 National Forest Management Act. (Forest Plan, page EE-5)

Hardwood – A broad-leaved flowering tree, as distinguished from a conifer. Trees belonging to the botanical group of angiospermae.

Harvest (Timber) – Cutting and removal of trees from the forest for utilization.

Interior Forest – An area of late successional or old growth forest that is large enough, and of an appropriate shape to provide conditions that minimize predation, parasitism, and microclimate fluctuations associated with forest edges. (Forest Plan, page EE-6)

Intolerant Species – Those plant species that do not grow well in shade.

Issue – A concern about an environmental consequence of agency action that is supported by scientific evidence or observation. Issues are identified through scoping and reviewed by the Responsible Official early in the process to determine those that are deserving of study (“Significant Issues”) and those that may be deemphasized (“Insignificant Issues”). (40 CFR 1501.1(d))

Land Type Association – One of the most basic ecological units for Forest-wide planning; describes areas of common ecosystem characteristics and generally (but not always) numbering in the thousands of acres. LTAs are defined by similarities in general topography, geomorphic process, geology, soil and potential plant community patterns. (Forest Plan, page EE-6)

Landscape Pattern – The spatial arrangement of forest patches composed of different species or successional stages. The term may also be applied to patches of different land uses, such as residential, commercial or agricultural. (Ref. 5) A landscape is a heterogeneous land area composed of a cluster of interacting ecosystems that is repeated in similar form throughout. (Forest Plan, page EE-7)

Management Area (Forest Plan) – Mapped areas of the Forest that are assigned specific management direction. Management direction for each area is defined in terms of Theme, Desired Future Condition, Vegetation Composition and Structure, Disturbance Regime, and Standards and Guidelines (Forest Plan, Page P-2).

Non-Native Invasive Species (NNIS) – Plant and animal species that are not native to the local ecosystem, and are likely to cause economic or environmental harm or harm to human health if introduced into the local ecosystem. (EO 13112, 1999)

Openings (Upland) – A specific area where shrubs, forbs, grasses and/or sedges predominate.

Permanent – An area maintained in an open state either naturally or through active maintenance. Includes maintained openings, small barrens communities, frost pockets, and other natural openings. (Forest Plan, page EE-9)

Temporary – A short-lived opening created by timber harvest, prescribed fires, or natural catastrophic occurrences (such as wildfire, insect and disease attack or windstorm) that is allowed or managed to grow back into closed forest cover.

Outputs – (as related to timber) A prediction of the timber products that would be available for personal or commercial use as a result of implementing an alternative. Outputs are measured in terms of the category of product (product is assigned on "capability" rather than actual use):

Sawtimber – commercially valuable timber products from the tree bole of a diameter, length and soundness such that it could be reasonably milled into dimensional lumber.

Pulpwood -- commercially valuable timber products from the tree top and bole of a diameter, length and soundness such that it could be reasonably processed as pulp for paper-making.

Biomass – commercially valuable timber products from tree tops, branches and bole portions that can not be utilized as sawtimber or pulpwood.

Patch – A structural component of a landscape. Landscapes have three structural components: a matrix – the most connected portion of similar vegetation within the landscape; patches – isolated portions of similar vegetation within the matrix; and corridors – relatively narrow areas that connect patches. (Forest Plan, page EE-9*)

Recreation Opportunity Spectrum (ROS) – The land classification system that categorizes land by its setting and the probable recreation experiences and activities it affords. ROS classes are used to describe all recreation opportunity areas; from natural, undisturbed, and undeveloped to heavily used, modified and developed. ROS designations attempt to describe the kind of recreation experience one may expect to have in a given part of the National Forest. (Forest Plan, page EE-9)

Regional Forester Sensitive Species (RFSS) – a species of plant or animal that is officially designated as such by one or more Regional Foresters on the basis of: 1) it is declining in numbers or occurrences and there is evidence that it could be proposed for federal listing as threatened or endangered if action is not take to reverse or stop the downward trend; 2) its habitat is declining and continued loss could result in population declines that lead to federal listing as threatened or endangered if action is not taken to reverse or stop the decline; and/or 3) its population or habitat is stable but limited. (Forest Plan, page EE-11)

Riparian Areas – A transition area between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water. (FSM 2526.05)

Roads – A road is a "motor vehicle route over 50 inches wide, unless identified and managed as a trail" (36 CFR 212.1). Additional terminology is used with "road" in the EIS to describe activities associated with roads.

Classified – A road wholly or partially within or adjacent to national Forest System lands that are determined to be needed for long-term motor vehicle access, including State roads, county roads, privately owned roads, National Forest System roads, and other roads authorized by the Forest Service (Forest Plan EE-11). This term is no longer used in Forest Travel Management and is replaced by the term "Forest Road" (36CFR212.1 (2006)).

Classification – A recording activity which identifies an existing, inventoried road as being needed for long-term resource management. Classification results in adding the existing road to the forest

transportation system. Under current terminology classification would result in the road becoming a "Forest Road". (36CFR212.1 (2006))

Construction – Activity that results in the addition of forest permanent road miles. Classified roads are intended to be a part of the forest transportation system and used for long-term resource management. Construction includes "Supervising, inspecting, actual building, and incurrence of all costs incidental to the construction of a road" (36CFR212.1 (2006)).

Decommissioning – Activities that result in the stabilization and restoration of unneeded roads to a more natural state. (36 CFR 212.1 (2006))

Reconstruction – Activity that results in improvement or realignment of an existing road. Reconstruction includes "Supervising, inspecting, actual building, and incurrence of all costs incidental to the reconstruction of a road". (36CFR212.1 (2006))

Maintenance – Activities that return the road to original specifications. Maintenance is "The upkeep of the entire forest transportation facility including surface and shoulders, parking and side areas, structures, and such traffic-control devices as are necessary for its safe and efficient utilization". (36CFR212.1 (2006))

Temporary Construction – Activity that results in the addition of forest temporary road miles. Temporary roads are not intended to be a part of the forest transportation system and not necessary for long-term resource management. They are decommissioned following completion of the project for which they were constructed.

Unauthorized Road - Previously called an unclassified road - Roads on National Forest System lands that are not managed as part of the forest transportation system, such as unplanned roads, abandoned travelways, and off-road vehicle tracks that have not been designated and managed as a trail; and those roads that were once under permit or other authorization and were not decommissioned upon the termination of the authorization.

Road Density – The quantity of road mileage per unit area. Measured as miles of road per square mile of land area. (Forest Plan EE-12)

Open Road Density – The linear measure of all roads open to public traffic per unit area. (Forest Plan, page EE-8)

Total Road Density – The linear measure of all roads (whether open or closed to vehicular traffic) per unit area. (Forest Plan, page EE-15)

Scenic Integrity Objective (SIO) – The visual objective for management of an area of the Forest; defining its permissible variation from the landscape's valued scenic character. Scenic integrity is the state of naturalness of an area, and is stated in degrees of deviation from the existing landscape character. The degrees of deviation are used to describe the existing scenic integrity, and the Forest Plan's scenic integrity objectives. (Forest Plan, page EE-13)

Species Viability – The occurrence or maintenance of self-sustaining and interacting populations that are well distributed through a species range.

Succession – A series of dynamic changes by which organisms succeed one another through plant community (seral) stages leading to a potential natural community or climax community. In the Plan Revision process, these are generally referred to as early, mid and late successional stages. Stages are transitory in nature, and describe a plant community from its earliest growth condition to a condition of full maturity. (Forest Plan, page EE-14)

Suitable Forest Land – Lands on a Forest that constitute the land base for determining the allowable sale quantity (ASQ) and which are managed for timber production on a regulated basis.

Threatened – Likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. (Forest Plan, page EE-15)

Trail – Any corridor on the land intended exclusively as a pathway for travel by foot, stock (i.e. horseback), or trail vehicles—such as bicycles, snowmobiles, all-terrain vehicles, and motorcycles. (Forest Plan, page EE-15)

Uneven-aged Management – The application of a combination of actions needed to simultaneously maintain continuous forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes. This can be applied to a specific stand of trees or an entire ecosystem. (Forest Plan, page EE-15)

Wetlands – An area where water is at, near, or above the land surface long enough to be capable of supporting aquatic or hydrophytic (water-loving) vegetation and which has soils indicative of wet conditions. (Wisconsin DNR PUB-FR-093 2003)

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APPENDIX C – OTHER (NON-SIGNIFICANT) ISSUES

The issues contained in this appendix are those potential issues that, when studied, resulted in only minor impacts, did not vary by alternative, or in some cases did not result in any measurable impacts (Chapter 1, Issues / Objectives). Some of these were issues about things that were unrelated to the proposal or alternative actions. Some of these issues have been addressed by requiring implementation of Forest Plan standards and guidelines. In cases where standards and guidelines reduce the potential for impacts to occur, a brief explanation of how they work and their effectiveness is given. Further explanation of the potential impacts associated with these minor issues can be found in the documents referenced in the specific statements below.

Environmental Justice

Executive Order 12898 requires Federal agencies to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of it activities on minority populations and low income populations. There have been no adverse human health impacts identified as associated with the actions proposed in this project. In considering whether or not environmental impacts will have an adverse impact on minority or low income populations, agencies should consider whether or not the impacts to low income and minority populations will exceed those impacts to the general population.

The types of activities proposed under this project would not have a disproportionately high and/or adverse effect on human health or the environment of minority and low-income populations. Human health and/or environmental effects as used in this Departmental Regulation include interrelated social and economic effects. The economic analysis conducted for the Park Falls Hardwoods project shows that effects would be beneficial in terms of income to the county and local community stability. This analysis surfaced no adverse economic effects.

This type of action is common in this area and past and present Interdisciplinary Teams have not found disproportionate and adverse effects to low-income or minority populations. Environmental impacts would be general and would not affect a particular population.

Initial scoping and tribal consultation provided that all populations had the opportunity to comment on and participate in the planning process. For further information on this issue, see the Project File (Environmental Justice Report for Park Falls Hardwoods Project).

Heritage Resources

The federal government is required by law to find and protect heritage resource sites that may be eligible for the National Register of Historic Places (NRHP). There is a concern that earth and vegetation disturbing activities could impact heritage sites (prehistoric and historic sites such as Indian campsites, burial grounds, logging camps, homesteads, etc.). All areas of the Park Falls Hardwoods project area have been surveyed for the presence of heritage (cultural) sites. Notifications of State Historic Preservation Officer (SHPO) review and concurrence have been received for all the surveys that have taken place. Forty cultural resource surveys have been conducted in the project area. These surveys were performed in response to requirements stipulated in the National Historic Preservation Act of 1966 (16 U.S.C. 470f), the specific compliance procedures outlined in 36 CFR 800, Protection of Historic Properties.

A total of thirty-six cultural resources have been recorded within the boundary of the Park Falls Hardwoods project area, thirty-four have not been evaluated for the NRHP; two sites do not require evaluation as one is on private property and the other is not eligible for the NRHP. The thirty-four unevaluated archaeological sites must be protected and avoided as stated in the Programmatic

Agreement with SHPO. Establishment of protective buffers surrounding these resources will ensure that the proposed action and alternatives will have no effect on unevaluated or NRHP-eligible cultural resources. Protective measures vary depending on specific cultural resource site characteristics. Minimally, no project-related surface disturbing activity can occur within 20-30 meters of a cultural resource boundary and during project implementation, this restriction would be monitored by the project manager.

There is always a remote possibility that an undiscovered site is present. If this was the case, there would be the potential to disturb the site. During a 10 year period (FY1991-FY2000) the Chequamegon-Nicolet National Forest's Heritage Resource staff monitored approximately 400 recorded heritage resource sites located on National Forest lands. Many of these sites were monitored because of their proximity to land and resource management activities that could potentially render adverse effects. In reviewing the results of those monitoring activities, it was found that only two of the 400 monitored sites had been impacted by management activities, for a 99.75% effectiveness rate. In fiscal year 2008, 95 sites were examined and none were damaged (Fiscal Year 2008 Monitoring and Evaluation Report for the CNNF, page 14).

In addition to establishing heritage site boundaries, guidelines require that activities be halted if previously undiscovered sites are found (Appendix E, Table E5, M262 and G263). For more information on this issue, see the Project File (Cultural Resource Report for the 2010 Park Falls Hardwoods Project and related project files). Because of these guides, there would be no direct or indirect effects to heritage resources from any of the alternatives currently being considered.

Recreation Opportunity

The Recreation Opportunity Spectrum (ROS) system was designed to help land managers evaluate recreational opportunities, categorize the types of settings where recreation occurs, and evaluate these settings based on a wide range of criteria. It encouraged managers to integrate existing resources into recreational opportunities, while providing an array of opportunities for the public. The descriptions used to classify the settings are on a range and are described as: rural, roaded natural, semi-primitive motorized, semi-primitive non- motorized, and primitive. There are no areas on the Chequamegon-Nicolet National Forest (Forest) that are classified as urban or primitive based upon the ROS criteria.

The Scenery Management System (SMS) described in the next issue takes into account ROS settings to determine the Scenic Integrity Objectives (SIO). By using SMS we take into account the effect of vegetation management activities on the ROS classifications. In particular, Semi-primitive Non-motorized (Elk River Area). Semi-Primitive Non-Motorized (MA 6B) character of the Elk River area will be maintained in all alternatives. This will be done by the elimination of motorized access by the public as well as following all Forest Plan standards and guidelines established for the MA 6B area (Appendix E, Table C5, G483, G484, and G486). For further information on this issue, see the Project File (Scenery Management Report for Park Falls Hardwoods Project).

Scenic Quality

For scenery management of visually sensitive areas and sites on the CNNF to enhance and protect recreational opportunities, the Scenery Management System was applied. The Scenery Management System is a systematic approach for determining the relative value and importance of scenery in a National Forest. SMS is to be used in the context of ecosystem management to inventory and analyze scenery in a National Forest, to assist in establishment of overall resource goals and objectives, to monitor the scenic resource, and to ensure high-quality scenery for future generations (Forest Plan FEIS Appendix G, p. G-14). There are six levels of Scenic Integrity Objectives (SIO): Very High (preservation), High (retention), Moderate (partial retention), Low (modification), Very Low (maximum modification), and Unacceptably Low (USDA Forest Service, 1995, p. 2-4). Within the project area, there are areas of high, moderate, and low scenic integrity. Table C1 identifies the High and Moderate SIO roads and trails within the Park Falls Hardwoods project area that the Forest Plan scenery management standards and guidelines may be applicable to depending upon the presence of adjacent timber harvest activities.

Table C1: High and Moderate SIOs in the Park Falls Hardwoods Project Area		
Road Number	**Miles in Project Area**	**SIO**
WI 70	1.7	High
FR 130	18.5	Moderate
FR 131	5.9	Moderate
FR 132	15.0	Moderate
FR 136	1.6	Moderate
FR 501	2.1	Moderate
FR 503	5.1	Moderate
FR 519	2.5	Moderate
Trail Name	**Trail Type and Miles**	**SIO**
Elk River Trail	Non-Motrized, 4.9	Moderate
Fould's Spring Trail	Non-Motrized, 0.8	Moderate

The project area includes some areas that are classed as travelways with high Scenic Integrity Objectives (SIOs, Forest Plan pages 2-29 thru 2-33 and Appendix HH, Forest Plan FEIS Map Set – High and Moderate Scenic Integrity Objectives). These are areas that would be managed to maintain minimal evidence of forest management activities within the area seen from the travelway. Timber harvest activity resulting in temporary openings along these travel areas would be evident and not fitting with the objectives of maintaining high scenic integrity. There are no temporary openings that could be seen from travelways with a high SIO.

Other travelways (including roads, trails, and rivers) with moderate to low scenic integrity objectives, are also within the project area, and while not as visually sensitive as high SIO areas, the creation of temporary openings from timber harvest can also be a visual impact, particularly when the openings might have an unnatural appearance or shape. Forest Plan guides require that temporary opening size along these travelways be minimized to be less visible (Appendix E, Table E5, G280, G281, G313 and G315).

Other timber harvest impacts that can make management more noticeable would be the tree tops (slash) left following harvest and the paint used to mark trees for harvest. Forest Plan guides require marking away from the travelway so that the paint would be less noticeable and there would also be treatment to logging slash which exceeds certain heights (Appendix E, Table E5, G300-G303, G305, G307-G310).

Because of these guidelines, scenic integrity of the area will be maintained in all alternatives. For further information on this issue, see the Project File (Scenery Management Report for Park Falls Hardwoods Project).

Public Access and Condition of the Public Motorized Transportation System

There is some potential for damaging existing roads from timber harvest activities, particularly those activities that pertain to access to the stands for logging. Some of these activities (skidding or log landings on or adjacent to main forest or town roads) could also result in road damage and potential safety hazards. Forest Plan guidelines minimize these impacts by requiring that landings and skid trails be placed off of these main roads (Appendix E, Table E5, G366-G368). Road weight restrictions imposed during spring thaw also reduces potential damage to roads from hauling forest products.

In addition, the Forest Service has agreements with townships to cooperatively perform road maintenance of town roads. Such cooperation includes engineering services, material sources, or cooperative construction services. Townships also receive gas tax monies to maintain town roads under their jurisdiction. The Forest Service also collects deposits on all timber sales for the use of roads maintained by the Forest Service. These deposits are used to repair roads where damage is not

immediately attributable to timber haul. These deposits are often used to periodically grade roads or replace surfacing materials.

Town and main forest roads that are open to public motorized use and used for timber haul will remain open to the public during the life of timber sale contracts.

Landscape Restoration and Road Decommissioning

Forest Plan standards require decommissioning of roads that are no longer needed for long-term access. There is a concern that these roads may be contributing to various impacts to water and soil productivity and they would not be restored to the extent needed to eliminate these impacts. Forest Plan guidelines define the extent of restoration activity that is needed for decommissioning roads based on the current road condition. Based on these guidelines, unacceptable impacts resulting from road decommissioning are not anticipated in any alternative. (Appendix E, Table E5, S29, G353, G354, M354, G355, G374).

Private Lands

The Federal government has a responsibility to avoid trespassing or adversely impacting private property in conjunction with any proposed project activities. Within the Park Falls Hardwoods project area there is private land adjacent to the proposed and alternative project activities. There is a concern that private property could be affected from tree tops being left (slash) or by inadvertently trespassing and cutting trees that are not on National Forest. The potential for trespass is reduced by requiring that property boundaries are surveyed and clearly marked prior to implementation of the proposed harvest activity. Within the project area, property lines adjacent to proposed timber harvest activity have been surveyed by a Licensed Professional Land Surveyor registered in the State of Wisconsin. Slash is required to be removed at least 10 feet from private property (Appendix E, Table E5, G302*).*

Special Uses

There are multiple special use permits that have been issued within the Park Falls Hardwoods project area. Most of these permits are for utility lines or access to private land. Special use permits are not affected / changed by any of the proposed activities in the project area. For instance, if there is a special use permit that allows motorized access to private property through an area that is considered non-motorized for the general public, that permit is in effect. None of the proposed road decommissioning projects would include decommissioning a road that is currently under permit for use. Those decisions would be made with the analysis for the requested special use, not as a part of the Park Falls Hardwoods project.

Regional Forester Sensitive Species (RFSS) - Botrichium Species

Three species of Botrychium [Mingan's moonwart (*Botrychium minganense*), goblin fern (*Botrychium mormo*), and blunt-lobed grapefern (*Botrychium oneidense*)] that may occur in the project area share similar habitat needs; mesic closed canopy forest. The analysis has been combined for these species as any proposed management would be expected to affect each in about the same way. Although the Park Falls Hardwoods project area contains suited forest types and habitat types, it does not have landtype associations (LTP's) that have been documented in the past as being suitable for Botrychium. Because many of the LTP types found in this project area had not been extensively surveyed for Botrychium in the past, a conservative approach was taken regarding surveys for these species. Surveys covering approximately 5,765 acres were conducted in 2007. Following surveys in 2007, the majority of the project area was deemed to have low to moderate potential for target Botrychium based on worm damage to the duff layer and/or O soil horizon, lack of microtopography such as extensive cradle-knoll features, or lack of other Botrychium species which possibly points to a lack of suitable mycrrohizal fungi. Follow-up surveys in 2010 were conducted to further refine habitat potential. Many of the stands initially deemed as moderate habitat were dropped to low habitat potential, primarily based on extensive worm damage. There is no RFSS Botrychium documented within the project area or on the Park Falls landbase.

Because there are no known sites for any of these species within the project area, there would be no direct effect. An indirect negative effect would include the action making other-wise suited but unoccupied habitat unsuited. There is no anticipated indirect effect from any of the action alternatives because:

Canopy closure in all hardwood selection harvests would remain above 75 to 80%. This follows the recommended canopy closure levels as stated in the Conservation Approach for Goblin Fern (Casson et al, 2002, p. 24) leaving treated stands suited habitat following treatment. This canopy closure minimum would also be adequate for Mingan's moonwort and blunt-lobed grapefern which are not as light sensitive as Goblin fern. Stands with suited habitat proposed for management would be harvested during frozen ground conditions. This would lead to a significant reduction in the potential for introduction or spread of invasive earthworms or plants. See Appendix E, Table E5, G386. Because no direct or indirect impacts are anticipated, no cumulative impacts are anticipated. For further information on Botrichium, see the Project File (Biological Evaluation – Plants – for the Park Falls Hardwoods Project, and supporting files).

RFSS - Spreading Woodfern (Dryopteris expansa)

In the western Great Lakes region, this fern is associated with moist, rocky talus slopes and ravines under full canopy closure of northern hardwood, talus, or boreal forest communities. It is often associated with nearby cold water streams, hillside seeps and springs, or cool air drainage. Understory plants typical of spreading woodfern sites include other ferns such as intermediate woodfern, spinulose woodfern, oak fern, long-beech fern, and the rare Braun's holly fern. Most sites include mountain maple as a mid-story associate, Canada yew, and overstory species such as white cedar, yellow birch, and hemlock. A majority of the known sites for this plant, both on the CNNF and in Wisconsin are found on the Penokee-Gogebic Iron Range landtype. This landtype appears to represent the "best-suited" habitat for this species on the Forest and in Wisconsin. In 2007, survey of approximately 5,765 acres indicated that the majority of those acres have low potential to harbor spreading woodfern. No sites for this species were found as part of these surveys. Follow-up surveys in 2010 collaborated that much of the habitat initially modeled as suited in 2007 was of low potential, primarily due to lack of microhabitat features such as wet exposed rock/talus features.

There are no occurrences of spreading woodfern in stands proposed for management in any of the alternatives, so there are no direct impacts to this species. An indirect negative effect would include the actions making other-wise suited but unoccupied habitat unsuited. There is no anticipated indirect effect from any of the alternatives because:

Canopy closure in all hardwood selection harvests would remain above 75 to 80%. Adherence to Wisconsin's Forestry Best Management Practices for Water Quality (BMPs) and Forest Plan guidelines would provide protection of this species habitat along rocky stream channels. The Forest Plan guideline directing avoidance of modifying microclimate and microhabitat conditions within steep ravines, cliffs, talus slopes, and areas of exposed bedrock would also maintain spreading woodfern habitat. Areas of exposed rock including slopes with talus would be used as within-stand reserve units. See Appendix E, Table E5, G25, G53). Because no direct or indirect impacts are anticipated, no cumulative impacts are anticipated. For further information on spreading woodfern, see the Project File (Biological Evaluation – Plants – for the Park Falls Hardwoods Project, and supporting files).

RFSS – Butternut (Juglans cinerea)

Butternut is a small to medium-size forest tree found in deep, moist, loamy areas throughout eastern North America. Butternut is experiencing a rapid decline due to the spread of butternut canker. The disease has spread rapidly throughout the species' range and this downward trend is likely to continue until disease resistant trees are identified, propagated and successfully reintroduced. Surveys within the Park Falls Hardwoods project area were conducted in 2007 in approximately 5,765 acres. One site for butternut was located as part of these surveys and represents the only documented site for this tree on the Park Falls landbase, although anecdotally, butternut is known from other sites on the district. The major threat to butternut throughout its entire range is susceptibility to the butternut canker disease caused by the fungus *Sirococcus clavigignenti-juglandacearum*. Because the threat to butternut is

related to the fungus and not impacts to habitat, the Forest Plan encourages management of stands with butternut and allows for the harvest of unhealthy trees. See Appendix E, Table E5, G52, M52a. Additionally, northern hardwood stands managed with individual tree selection harvest would utilize canopy gaps creating favorable habitat for butternut regeneration if nut bearing trees occur. While unhealthy butternut could be harvested, this action would not further the decline of this species and there are no indirect or cumulative impacts expected to butternut from the alternatives. For further information on butternut, see the Project File (Biological Evaluation – Plants – for the Park Falls Hardwoods Project, and supporting files).

RFSS – Likely to Occur - Large Toothwart (Cardamine maxima)

Large toothwort is a rare member of the mustard family. In Wisconsin habitat is described as "rich river bottom forest with American elm." There are no sites known for large toothwort on the Forest. Surveys within the Park Falls Hardwoods Project Area were conducted in 2007 over approximately 5,765 acres. No sites for this species were found as part of these surveys.

There are no occurrences of large toothwart in stands proposed for management in any of the alternatives, so there are no direct impacts to this species. An indirect negative effect would include the actions making other-wise suited but unoccupied habitat unsuited. There is no anticipated indirect effect from any of the alternatives because:

Canopy closure in all hardwood selection harvests would remain above 75 to 80%. Stands with suited habitat proposed for management would be harvested during the winter lessening impact to understory species including large toothwort, if it was present. See Appendix E, Table E5, G386. Because no direct or indirect impacts are anticipated, no cumulative impacts are anticipated. For further information on large toothwart, see the Project File (Biological Evaluation – Plants – for the Park Falls Hardwoods Project, and supporting files).

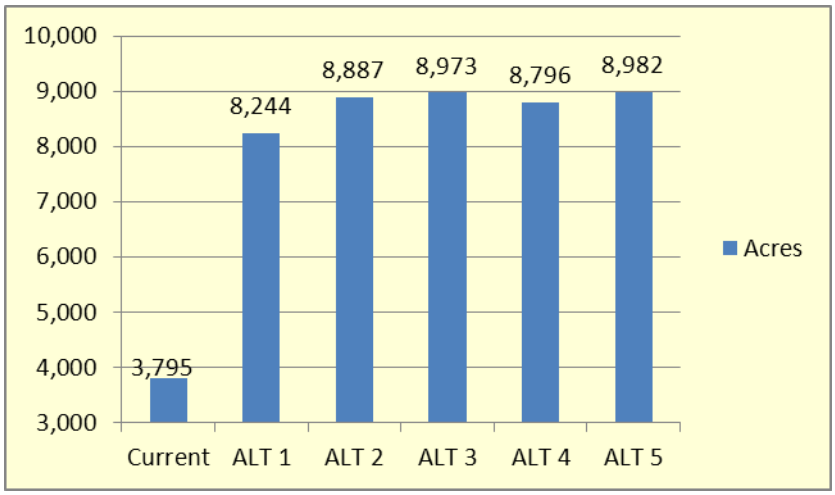
Mature Northern Hardwood Interior Forest Management Indicator Habitat (MIH)

The Chequamegon-Nicolet National Forest 2004 Land and Resource Management Plan (Forest Plan) identifies four Management Indicator Habitats (Forest Plan, Appendix II, page II-1). The Forest Plan (page 4-6) identifies the MIH that are required to be monitored on a yearly basis and evaluated every five years. Based on the criteria described in "An Assessment of Mature Northern Hardwood Interior Forest on the Chequamegon-Nicolet National Forest" (Quinn and Lopez 2006), there are currently about 3,795 acres of mature northern hardwood interior forest within the project area.

None of the activities planned in any alternative would result in a decrease of this habitat over time. There are no direct impacts expected in any alternative. Indirect effects are expected to occur as a result of the proposed aspen conversions to mixed hardwood which is expected to increase the current acreage of mature northern hardwood interior forest in the long term future (about 80 years after implementation). Most of the increase in this MIH results from allowing the existing hardwood types to mature, rather than from converting other forest types to hardwoods. As can be seen from Figure C1, there is a large jump in the amount of this MIH from the current condition in all the alternatives. Even the No Action Alternative (Alternative 1) is more than double the amount shown currently, as are all the action alternatives. Because the increase in this habitat that is a result of the activities being proposed does not show up for 80 years and most of the impact is a result of natural aging and not a result of the proposed activities, there is little difference between the alternatives pertaining to this MIH.

Overall, there is an increasing trend in this MIH in all alternatives. This increasing trend is consistent with the expectations of the purpose and need of the Park Falls Hardwoods project and the objectives of the Forest Plan. Any further development of mature, interior hardwood will depend on the continued management of existing mature hardwood and the adjacent hardwood stands which are not reasonably foreseeable at this time.

Figure C1: 80-year Projection of Mature, Northern Hardwood Interior Forest by Alternative



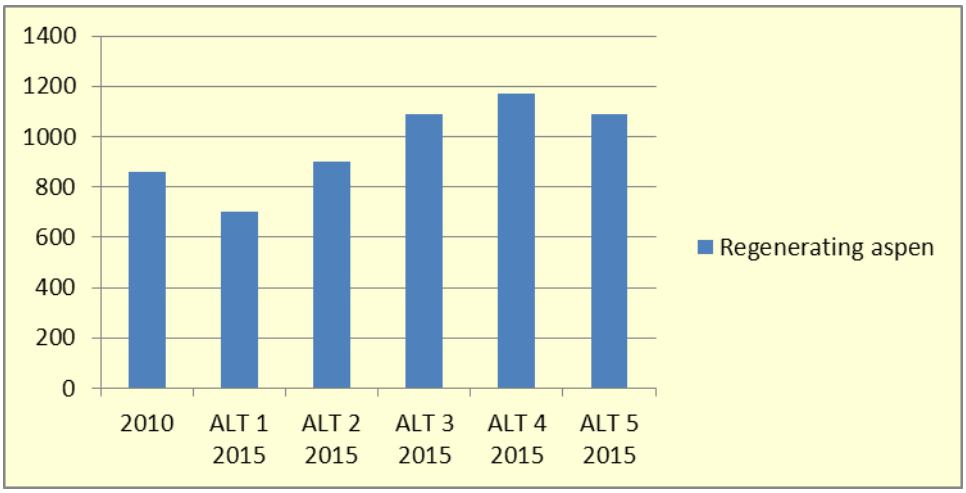
Based on these findings, any impacts to this MIH resulting from the proposed and projected forest management activities are very minor and are in-line with the trends expected for the Forest. There are no recommendations for additional project design features. The standard monitoring requirements for this MIH outlined in Chapter 4 of the Forest Plan will continue. For further information on this issue, see the Project File (Management Indicator Habitats report).

Regenerating Aspen MIH

Regenerating aspen is defined as "aspen less than 20 years of age" (Quinn and Schmidt 2007). In 2006 14,793 acres of aspen, 0-19 years in age, were on the Medford-Park Falls Ranger District. This represents 21% of the Forest's total regenerating aspen. The 2004 Forest Plan anticipates small and gradual declines in regenerating aspen over several decades. The portion of the project area impacted by activities that could change the amount of regenerating aspen is MA 2B. Within this analysis area (MA 2B), there is about 6,049 acres of aspen. Of this, 861 acres of this is currently 0-19 years in age or considered regenerating aspen.

Figure C2 shows that the short term trend for regenerating aspen within the project area as a direct result of this action is relatively stable across all alternatives. Alternative 1 (no action) shows a slight decrease, while all the action alternatives show a slight increase in the amount of regenerating aspen. Over time, even with future projects to regenerate aspen, the overall amount of regenerating aspen would decrease. This decreasing trend is consistent with the expectations of the purpose and need of the Park Falls Hardwoods project and the objectives of the Forest Plan.

Figure C2: Short Term (5 years) Trend of Regenerating Aspen by Alternative



Because the expected impacts on the existing regenerating aspen are minor and within the range of expected trends on the Forest, there are no recommendations for additional project design features. The standard monitoring requirements for this MIH outlined in Chapter 4 of the Forest Plan will continue. For further information on this issue, see the Project File (Management Indicator Habitats report).

Mature Natural Red/White Pine MIH

This MIH is dominated by red or white pine and is of "natural" origin. Natural origin refers to pine stands that are not of plantation origin implicating they are either fire origin or from natural seeding. It is assumed that a red or white pine stand with a year of origin prior to 1933 (77 years old) is natural. There are 2 stands of white pine comprising 15 acres within an 8E Management Area (MA) within the project area boundary. These areas are not being impacted by project activities that could change their mature or natural origin character, so no further analysis was conducted. For further information on this issue, see the Project File (Management Indicator Habitats report).

Pine Barrens MIH

There are no pine barrens within this project area or on the Medford-Park Falls Ranger District. The pine barren ecosystem is only located on the Washburn Ranger District of the CNNF. There are no direct, indirect or cumulative effects associated with this cover type and the alternatives being considered in the Park Falls Hardwoods project. For further information on this issue, see the Project File (Management Indicator Habitats report).

Non-native, Invasive Species (NNIS)

NNIS are plants that have the capacity to transform or dominate native plant communities, thus potentially causing a loss of natural variability and biodiversity within the plant community. Seeds of NNIS are spread via equipment and motor vehicles, humans, animals, and wind. Soils disturbed by skidding logs and road construction can provide ideal habitat for invasive plants. Many non-native invasive plant species take advantage of disturbance situations to enter and invade native plant communities. There are 24 documented NNIS sites covering about 12 acres on federal land within the project area. All of the known NNIS sites in the project area occur in areas heavily impacted by past management activity such as road corridors, timber salvage operations, created openings, and active or closed gravel pits. 39% of the documented sites representing over 50% of the gross acreage are found in gravel or old borrow pits. Another 38% of the gross acreage is found in a recent spruce salvage stand. 43% of the sites are represented by a single species, spotted knapweed (Centaurea bieberstenii), which requires full sun and soil disturbance. Other species include Canada thistle (Cirsium arvense) which is known from 4 sites that

cover nearly 60% of the infested acres in the project area, bull thistle (Cirsium vulgare), a Eurasian honeysuckle species (Lonicera sp.), giant reed (Phragmites australis), garlic mustard (Allaria petiolata), brittlestem hempnettle (Galeopsis tetrahit) and wild parsnip (Pastinaca sativa).

Invasive plants on the National Forest are inventoried, monitored, and treated on an ongoing basis using a number of methods. A number of NNIS sites within the project area have received treatment over the past several years including continued control and monitoring in 2010. Two previous NNIS control decisions cover NNIS control treatments on the forest including sites within the project area. Work to control invasive plants under those decisions would continue within the project area regardless of any decisions made regarding the Park Falls Hardwoods project.

Forest Plan standards, guidelines and other required design features would reduce the potential for introduction of new NNIS into the area as well as reduce the spread of existing populations. Project design works to prevent weed establishment in a number of ways, including restricting management activities to times of frozen soil, equipment cleaning provisions in timber sale contracts, avoidance of travel through known weed sites, minimizing soil disturbance, and using weed-free gravel sources for road construction or reconstruction (Appendix E, Table E5, G234, M234a-M234c, G374, G375, and G386). These measures would reduce the probability of spreading weed seeds and plant parts.

Although it is impossible to fully rule out the introduction or spread of invasive plants, as a result of the relatively short duration of soil disturbance, the extensive measures to minimize spread through project design, and existing and foreseeable future NNIS control actions, the overall risk of NNIS spread from the proposed action or any of the alternatives would be minimal.

While the effectiveness of these measures in preventing NNIS spread on the Forest is unclear at this time (because they have only recently been implemented and there is little local monitoring data to assess their effectiveness over time), the contractual equipment cleaning clause is commonly used on western Forests, both in vegetation management and wildland fire related activities, and is considered to be an effective means of slowing the spread of NNIS (USDA Forest Service-MTDC, 2002). In addition, recent research indicates that vehicle wash stations and equipment cleaning can reduce the risk of spread of invasive species (Rew and Pollnac, 2010). Forest-wide inventory and surveys, which are intended to detect new infestations early on in the invasion process, will also help in preventing NNIS spread. The Forest continues to collect monitoring data to further assess the effectiveness of both the mitigation measures and NNIS control projects. Based on the best available science and information, activities in all alternatives are not anticipated to cumulatively increase the risk of weed spread within the project area or forest-wide. For further information on this issue, see the Project File (Non-Native Invasive Species Resource Report and supporting files).

Federally threatened - Eastern gray wolf.

Wolf habitat has been defined as areas having the following characteristics (Mladenoff et al. 1995, 1997; WDNR, 1999): low human population densities; sufficient prey (deer, beaver, etc.); low road densities (4.8 km/km2 or 2.9 mi/mi2); appropriate vegetation cover and landscape patterns.

Of these elements, road density and complexity of the spatial landscape pattern (low fragmentation from agricultural or urbanizing landscape) appear to be the most important. Based on these criteria, the WDNR (1999) estimates that there are currently 15,052 km2 (5811 mi2) of favorable habitat in the state. This includes an estimated 75% of the CNNF landbase, because it is relatively undeveloped and generally falls in the road density range suitable for wolves as described in the Eastern Timber Wolf Recovery Plan (USFWF, 1978 and 1992; WDNR 1999). Additionally, prey availability also plays a key role in defining wolf habitat. Wolves are large carnivores that require an abundance of prey such as white-tailed deer and beaver to survive. Deer are generally associated with early successional habitat; however, in recent years (mid-1980s to present), the CNNF and Wisconsin in general has experienced increased numbers of deer (Quinn et al 2006, WDNR 2005a). The deer population, along with beaver and other prey items appear to be sufficient for wolves in the Park Falls Hardwoods project area.

There are four active wolf packs that utilize most of the Park Falls Hardwoods project area.

Effects to wolves from management activities can be measured in three ways: disturbance of denning or rendezvous sites, certain changes in road densities, and changes in prey availability. There are currently no known denning or rendezvous sites in the project area. There will be no changes in road densities that apply to wolves (Maintenance levels 3, 4, or 5 roads) in the Park Falls Hardwoods project. Prey abundance is not expected to be limiting in the Park Falls Hardwoods area. In summary, no direct, indirect, or cumulative impacts to wolf were expected in any alternative. For additional information on wolves and the analysis of impacts, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files). This species is no longer federally listed, but has been placed on our Regional Forester Sensitive Species list.

RFSS - LeConte's Sparrow (Ammodramus leconteii)

LeConte's sparrow was located five different years in one stand in the project area between 1995 and 2007 by contracted Natural Resources Research Institute, University of Minnesota - Duluth (NRRI) bird surveyors, with two individuals located in 2007. A total of 24 points are surveyed by NRRI bird surveyors yearly in the Park Falls Hardwoods project area. No other occurrences have been documented by NRRI surveyors in the years since, and there were no incidental sightings recorded by contract hawk and Swainson 's thrush surveyors in 2007.

Preferred habitat for LeConte's sparrow is open uplands and lowlands including sedge meadows, hayfields, and idle pastures with dense native or planted grasses. The stand that this species was located in is typed as sedge meadow and is over 100 acres in size. There are a total of 578 acres of potential suitable habitat (lowland meadows, contiguous 40 acres or larger) of Forest Service lands within the Park Falls Hardwoods boundary. Additionally there are 5,485 acres of possible suitable habitat typed as "lowland opening" on non-Forest Service lands within the Park Falls Hardwoods boundary and within 1 mile outside of the boundary.

There will be no proposed projects in any alternative that would impact the known location, nor any expected impacts to nesting habitat in or adjacent to the project area. Any harvesting adjacent to the known location would occur in the winter months, and so there would be no potential to disturb any potentially active nests. See Appendix E, Table E5, G178 and G386. Based on no direct impacts to the potentially existing population, and no indirect impacts to habitat, there would be no cumulative impacts to LeConte's sparrow. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS - Cerulean Warbler (Oporornis agilis)

Cerulean warbler has never been located within the Park Falls Hardwoods project area despite surveys conducted yearly by NRRI, and 2007 contracted surveys for hawks and Swainson's thrush. A total of 24 points are surveyed by NRRI bird surveyors yearly in the project area. Cerulean warbler habitat is larger tracts of hardwoods with larger diameter trees. Prime habitat is bottomland hardwoods associated with large river systems like the Mississippi and Ohio. One stronghold for this species in Wisconsin is Wyalusing State Park, located at the confluence of the Wisconsin and Mississippi Rivers. The Chequamegon-Nicolet National Forest is located at the northern edge of cerulean warbler range, so the Medford landbase would be more likely to have species occurrence.

There will be no proposed projects in any alternative that would impact a known nesting location of cerulean warbler. Indirect impacts could occur as a result of making otherwise suited habitat unsuitable. Looking at suitable habitat for cerulean warbler strictly by the developed Forest model (USDA Forest Service, 2009b), there are 2,016 acres of habitat on Forest Service lands within the Park Falls Hardwoods project area. Of the 2,016 acres of suitable habitat in the project area, up to 1,620 acres (80% of suitable habitat) could have some partial harvest of trees (thinning or selection harvest) in the action alternatives. Management of the hardwoods would benefit cerulean warbler by moving stands towards an uneven-aged condition and larger diameter trees.

While Park Falls Hardwoods alternatives 2-5 call for harvesting in a majority of the acres of suitable habitat for cerulean warbler, there will be no detrimental direct, indirect, or cumulative impacts because: It is unlikely cerulean would utilize the project area (no larger river or bottomland hardwoods and north of

normal cerulean range. Any thinning or selection harvesting in hardwoods would provide a long term benefit for cerulean warbler by increasing tree diameter over time. All hardwood harvesting will occur in the winter and so all hardwood stands are available for undisturbed nesting during the breeding season. See Appendix E, Table E5, G386. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS - Connecticut Warbler (Oporornis agilis)

This species was located in 1995 in the project area by contracted NRRI bird surveyors. No other occurrences have been documented by NRRI surveyors in the years since, and there were no incidental sightings recorded by contract hawk and Swainson's thrush surveyors in 2007. Connecticut warbler keys in on understory Ericaceous plant species presence, a factor that is not tracked in Forest databases. Lacking understory plant species information, suitable habitat is limited to lowland coniferous forest, jack pine, mixed jack pine and oak, mixed swamp conifer, and lowland ash/elm/red maple stands. There are a total of 6,312 acres of suitable habitat on Forest Service lands within the project area. All of these acres of suitable habitat are lowland acres of mixed swamp conifer or hardwoods. There is a maximum of 47 acres (less than 1% of habitat) that are proposed for harvest in any alternative, and these stands are only to remove some of the black ash in advance of emerald ash borer. These stands would likely still maintain some habitat as they are mixed stands and are not going to be clearcut. There is a chance that harvesting machinery might damage any existing Ericaceous plants (presence unknown), but this will be minimized by frozen ground only harvesting. See Appendix E, Table E5, G386.

While some of the action alternatives for Park Falls Hardwoods project could result in harvest treatments within the area identified as having an occurrence of this warbler or within suitable habitat, there will be no detrimental direct, indirect, or cumulative impacts because: The only recorded occurrence of this warbler in the project area was over a decade ago and no further sightings have occurred despite focused and incidental surveys conducted in the project area. Less than 1% of suitable habitat is affected in any alternative. More than 99% of the suitable habitat remains unaffected. If harvest occurs in suitable habitat, these stands would be harvested in winter and would continue to be available for undisturbed nesting during the breeding season. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS - Black-backed Woodpecker (Picoides arcticus)

There are no known occurrences of black-backed woodpecker within the Park Falls Hardwoods project area, and very few sightings have occurred on the Park Falls landbase. A total of 24 points are surveyed by NRRI bird surveyors yearly in the project area. This woodpecker prefers dead or dying conifer, especially jack pine, balsam fir and lowland conifer. Suitable habitat is defined as jack pine and balsam fir greater than 60 years old, and lowland conifer types of any age. The species disperses widely and can irrupt given large amounts of good habitat (i.e. after a fire, insect, or other large area of preferred tree species die-off).

There is a maximum of 13 acres (less than 1% of habitat) that are proposed for harvest in any alternative, and this stand would still maintain some habitat because of Forest Plan guidelines which maintain snags and denning trees. See Appendix E, Table E5, G123. Because of this, the Park Falls Hardwoods proposals and alternatives are not expected to have any detrimental direct, indirect, or cumulative impacts to black-backed woodpecker. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS - Wood Turtle [Glyptemys (Clemmys) insculpta]

Wood turtle has been documented in the Elk River watershed approximately 2 miles outside of the Park Falls Hardwoods project area. It has not been documented within the project area boundary, and there are no known nesting sites. They nest on sandy banks adjacent to medium-large rivers, and this nesting habitat will not be affected in any alternative. They have been found to forage in all adjacent upland and lowland types, up to approximately 300 meters from the water (Bowen and Gillingham, 2004, p.33). When harvest activity occurs while the turtles are active, they could be inadvertently impacted. This has

the potential to occur in a maximum of 2 small areas along the Elk River in any alternative. Detrimental impacts (direct, indirect, or cumulative) to this species are not expected. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS - Henry's Elfin Butterfly (Incisalia henrici)

There has only been one record of Henry's elfin butterfly located on the Park Falls landbase (located approximately 2 miles west of the northern portion of the Park Falls Hardwoods project area). Henry's elfin habitat is young jack pine, oak barrens, and boggy areas, which is defined in the 2009 Habitat Models for Effects Analyses process paper as jack pine 0-5 years old, mixed jack pine and oak 0-5 years old, mixed pine stands 0-5 years old, upland shrub <50% cover, openings and wetland bogs. The known location on the Park Falls landbase is in association with large and extensive open bog habitat. This is the only known location on the Forest. There are no activities or treatments being proposed in any alternative within suitable habitat for this species. No direct, indirect, or cumulative impacts are expected. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS - Tawny Crescent Spot (Phyciodes batesii)

There has been one record of tawny crescent spot butterfly in the Park Falls Hardwoods project area from a 2003 contract survey. Another record from the same year and contract survey was located in the area just to the west of the northern portion of the project area. These are the only two known records for Price County. The tawny crescent spot prefers open areas, with 26 of the 40 known sites located on Washburn Ranger District which has large expanses of jack pine barrens habitat. Larvae eat the foliage of Aster spp., primarily *Aster laevis* in Wisconsin. There are 1,064 acres of suitable habitat within the Park Falls Hardwoods project area. These acres are all open upland or lowland wetlands, and the Park Falls Hardwoods project will not impact any suitable habitat acres in any alternative. No direct, indirect, or cumulative impacts are expected. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS - West Virginia White (Pieris virginiensis)

West Virginia white habitat is rich northern hardwoods with toothwort (Cardamine sp) with 80% canopy cover or more. Most of the known Forest populations (over 90%) are on the Nicolet landbase. Surveys have been conducted for West Virginia white on the Park Falls landbase and in the Park Falls Hardwoods project area in 2002 and 2003, but no individuals or populations have been located. Overall there are 18,620 acres of suitable forest type for West Virgina white in the project area (not taking soil types for toothwort into account). While there is harvesting proposed in the alternatives in varying amounts within potential hardwood habitat, the impact to the habitat would be short term and minor. Canopy closure would drop below the suitable 80% level in about ½ of the areas proposed for harvest. Canopy closure would be expected to be back to 80% within 5 years. Because of the short term impact to only a portion of the habitat and because there are no individuals known to be present, there are no expected detrimental direct, indirect, or cumulative impacts to this species. For further information on this issue, see the Project File (Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files).

RFSS Plants and Animals – Other Species Considered

The Forest Service is responsible for disclosing the effects of its actions on federally listed species (TES) and RFSS where they occur within National Forest boundaries. In both the plant and animal biological evaluations (BEs) and addendums for the Park Falls Hardwoods project, 105 species were considered. Nine species are discussed in detail in Chapter 3 of this EIS and another 14 species are discussed above in this appendix. Table C2 lists the remaining 82 species. The 14 RFSS species discussed in this appendix are those that are likely to occur in the project area, or do occur in the project area, but after some analysis, no detrimental impact that could cause federal listing is expected. Any detrimental

impacts would be expected to be minor or not to occur at all. The remaining 82 species listed in Table C2 are not likely to occur in the project area. Habitat within the project area does not exist, or is not suitable and/or species has no recent record of occurrence on the CNNF, though they may occur within the region. Or, some habitat exists or the species may or may not have been documented on the CNNF, but the likelihood of occurrence within the project area or affected area is low. For further information on these species, see the Project File (supporting documents for Biological Evaluation – Plants – for the Park Falls Hardwoods Project and Biological Evaluation Park Falls Hardwoods Project, June 2011 and addendums and supporting project files).

In 2011, a review of the RFSS list was conducted and several species that were analyzed for this project are no longer considered to be potentially trending to federal listing and have been removed from the RFSS list (USDA Forest Service 2011). Other species were added to the RFSS list. For this DEIS and the supporting biological evaluations and addendums, any species that was added to the list was analyzed and the biological evaluations for this project were updated. Species removed from the RFSS list still appear in this document as RFSS. Regardless of their status as an RFSS, Forest Plan standards and guidelines would still apply as indicated in Appendix F. Animals no longer listed as RFSS include timber wolf, northern goshawk, Swainson's thrush, black tern, trumpeter swan and tawny crescent. Plants no longer listed include assiniboine (stoloniferous) sedge, sheathed sedge, northern wild comfrey, and white adder's mouth. Three bat species were added to the list along with 4 plants. See Chapter 3 of this section for additional information on bats and northern bur-reed. The remaining 3 plants added to the list are identified in Table C2 below along with other species that are not likely to occur in the project area.

Table C2: TES and RFSS Species Not Expected to be Impacted by the Park Falls Hardwoods Project

Last Column Key: None - Habitat within the project area does not exist, or is not suitable and/or species has no recent record of occurrence on Forest though may occur within region. Minimal - Some habitat exists; species may or may not have been documented on Forest. Likelihood of occurrence within the project area or proposed project area is low.

Species	Common Name	Occurrence or Habitat Potential*
Federally Listed		
Lynx canadensis	Canada lynx	None
Dendroica kirtlandii	Kirtland's Warbler	None
Oxytropis campestris var. chartacea	Fassett's locoweed	None
Animals - RFSS		
Bartramia longicauda	Upland sandpiper	None
Chlidonias niger	Black tern	Minimal
Cygnus buccinator	Trumpeter swan	Minimal
Haliaeetus leucocephalus	Bald eagle	Minimal
Martes americana	American marten	Minimal
Tympanuchus phasianellus	Sharp-tailed grouse	None
Acipenser fulvescens	Lake sturgeon	None
Moxostoma valenciennesi	Greater redhorse	None
Notropis anogenus	Pugnose shiner	None
Venustaconcha ellipsiformis	Ellipse mussel	None
Gomphus viridifrons	Green-faced clubtail	None
Lycaeides idas nabokovi	Northern blue butterfly	None
Oeneis chryxus	Brown (Cryxus) arctic	None
Ophiogomphus anomalus	Extra-striped snaketail	None
Ophiogomphus howei	Pygmy snaketail	None
Plants - RFSS		
Amerorchis rotundifolia	Round-leaved orchis	None
Arabis missouriensis var deamii	Missouri rock cress	None
Asplenium trichomanes-ramosum	Green spleenwort	None
Astragalus alpinus	Alpine milk vetch	None
Botrychium pallidum	Pale moonwort	Minimal
Botrychium rugulosum	Ternate grapefern	None

Table C2: TES and RFSS Species Not Expected to be Impacted by the Park Falls Hardwoods Project		
Last Column Key: None - Habitat within the project area does not exist, or is not suitable and/or species has no recent record of occurrence on Forest though may occur within region. Minimal - Some habitat exists; species may or may not have been documented on Forest. Likelihood of occurrence within the project area or proposed project area is low.		
Species	**Common Name**	**Occurrence or Habitat Potential***
Callitriche hermaphroditica	Northern water-starwort	None
Callitriche heterophylla	Two headed water starwort	None
Caloplaca parvula	A lichen	Minimal
Calypso bulbosa	Calypso orchid - Fairy slipper	None
Carex backii	Rocky Mountain sedge	None
Carex crawei	Crawe's sedge	None
Carex gynocrates	Northern bog sedge	None
Carex livida var radicaulis	Livid sedge	None
Carex michauxiana	Michaux's sedge	None
Carex sychnocephala	Many-headed sedge	None
Carex vaginata	Sheathed sedge	None
Ceratophyllum echinatum	Spineless hornwort	None
Cynoglossum virginianum var. boreale	Northern wild comfrey	None
Cypripedium arietinum	Ram's head lady's slipper	None
Diplazium pycnocarpon	Glade fern	None
Dryopteris filix-mas	Male fern	None
Dryopteris fragrans var. remotiuscula	Fragrant fern	None
Eleocharis olivacea	Capitate spike-rush	None
Eleocharis quinqueflora	Few-flowered spike-rush	None
Epilobium palustre	Marsh willow-herb	None
Equisetum palustre	Marsh horsetail	None
Eriophorum chamissonis	Rusty cotton-grass	None
Huperzia selago	Fir clubmoss	None
Juncus stygius	Bog (moor) rush	None
Leucophysalis grandiflora	Large-flowered ground cherry	None
Littorella uniflora	American shore-grass	None
Malaxis brachypoda	White adder's mouth	Minimal
Mellica smithii	Smith's melicgrass	None
Moehringia macrophylla	Large-leaved sandwort	None
Myriophyllum farwellii	Farwell's water-milfoil	None
Parnassia palustris	Marsh grass-of-parnassus	None
Poa paludigena	Bog bluegrass	None
Polemonium occidentale var. lacustre	Western Jacob's ladder	None
Piptatherum canadense	Canada mountain-ricegrass	None
Polystichum braunii	Braun's holly fern	None
Potamogeton confervoides	Algae-like pondweed	None
Potamogeton hillii	Hill's pondweed	None
Pyrola minor	Lesser wintergreen	None
Ranunculus gmelinii	Small yellow water-crowfoot	None
Rhynchospora fusca	Brown beak-sedge	None
Streptopus amplexifolius	White mandarin	None
Tiarella cordifolia	Foamflower	None
Usnea longissima	Methuselah's beard (lichen)	None
Vaccinium caespitosum	Dwarf huckleberry	None
Valeriana uliginosa	Marsh valerian	None
Animals – RFSS, Likely to Occur		

Table C2: TES and RFSS Species Not Expected to be Impacted by the Park Falls Hardwoods Project		
Last Column Key: None - Habitat within the project area does not exist, or is not suitable and/or species has no recent record of occurrence on Forest though may occur within region. Minimal - Some habitat exists; species may or may not have been documented on Forest. Likelihood of occurrence within the project area or proposed project area is low.		
Species	**Common Name**	**Occurrence or Habitat Potential***
Pipistrellus subflavus	Eastern pipistrelle	None
Plethobasus cyphyus	Bullhead mussel	None
Somatochlora forcipata	Forcipate emerald	None
Plants – RFSS, Likely to Occur		
Carex lenticularis	Shore sedge	None
Disporum hookeri	Fairy bells, Hooker's mandarin	None
Eleocharis engelmannii	Engelmann's spike-rush	None
Listera auriculata	Auricled twayblade	None
Listera convallarioides	Broad-leaved twayblade	None
Petasites sagittatus	Arrow-leaved sweet colt's-foot	None
Platanthera flava var herbiola	Pale-green orchid	None
Potamogeton pulcher	Spotted pondweed	None
Pterospora andromeda	Giant pinedrops	None
Ranunculus lapponicus	Lapland buttercup	None

General Wildlife and Impacts from Roads

The existence of roads, or construction of new roads, can affect wildlife habitat and populations in a number of ways. Examples include direct mortality from vehicle collisions, disruption of movement and dispersal, and habitat fragmentation. Effects can be both local, from individual roads, or cumulative, based on overall road densities within a larger area. It has been estimated that Forest-wide the road system occupies about 2.2% of the land base (Forest Plan FEIS, p. 3-108).

A direct effect of permanent road construction would be the loss of habitat (change from forest condition to road surface and cleared corridor). All of the proposed construction would be low-standard roads, with a maximum cleared right-of-way of 32 feet, which amounts to approximately 4 acres/mile. Some of the indirect effects of roads and road construction include habitat fragmentation, and the barrier effect to animal movement. Mortality on most forest roads is minimal since the speeds involved are low compared to paved roads. In a comparison of effects by alternative, all action alternatives would reduce total road miles compared to the current condition. Although permanent road construction is proposed in all action alternatives, there is still more road closure and road decommissioning that would take place (the decommissioning would completely remove the road base and corridor from the landscape over time). As a result, all of the alternatives would, over time, reduce habitat loss, reduce habitat fragmentation and associated concerns, and reduce barriers to animal movements.

Another indirect effect of roads on the landscape is the increased human use of an area due to ease of motorized access (this applies to open roads only). This increased use can affect wildlife populations by increasing both legal and illegal activities (Trombulak and Frissell, 2000, p. 24). Increased hunting and/or poaching can affect species such as wolf, black bear, coyote, white-tailed deer, ruffed grouse, and fisher. Some nesting birds such as northern goshawk and great blue herons can be affected by increased disturbance due to road locations. Potential effects from roads on wildlife species of concern such as threatened, endangered or sensitive species are addressed in the Project File (PF), Biological Evaluation Park Falls Hardwoods Project, June 2011, and supporting files, and in Chapter 3 of this document, as applicable. In a comparison of alternatives, all action alternatives would increase the miles of roads open to public motorized use compared to the current condition (to about 1.3 miles per square mile open to some type of public motorized use). For further information on this issue, see the Project File (Wildlife Specialist Report and supporting files).

Water Quality - Water Runoff and Peak Channel Flows

An open area analysis was conducted for the Park Falls Hardwoods project. The open area analysis examines the relationship between non-forested areas and changes in the timing, magnitude, and duration of water run-off from snow melt and rain events. Snow melts earlier and faster in open areas which increases the amount and timing of run-off reaching streams. Within a watershed, if 60% of the area is non-forested (Verry 1972), it is predicted that streams within the watershed would experience greater peak flows which could cause in-channel erosion. Non-forested lands include permanent forest openings, clearings on private land, roads, utility corridors, clearcuts, and young forest (< 15 years old). The 8 sub-watersheds that lie within the Park Falls Hardwoods project area are primarily forested watersheds; the open area percent for that area is less than 32%. This was estimated using the Forest's GIS private land coverage and the Medford-Park Falls Ranger District vegetation coverage data. Lowland openings, upland openings, clearcuts, and agriculture land was identified as open land. This indicates there would be much less open area created by this project and the existing open land than would be required to detrimentally alter hydrologic function. In summary, the small amount of open area creation for this project, along with the existing opening amount is not expected to result in changes to peak water flows from implementation of any alternative. For further information on this issue, see the Project File (Water Resources Report for the Park Falls Hardwoods Project, and supporting files).

Climate Change

Climate change is being addressed at all levels in the Forest Service, as well as outside of the Forest Service at a global scale. The Forest Service is working with other agencies and scientists to develop strategies for addressing climate change. One effort, "the Eastern Region Climate Change Strategy", is conducted within the broad structure of an interagency Global Change Research Program authorized by Congress and the President. It is tiered to the Forest Service strategies for climate change and climate change research (USDA Forest Service 2008e). Another more local effort, the "Climate Change Response Framework at Chequamegon-Nicolet National Forest", will serve as a model for climate change adaptation and mitigation for national forests both regionally and nationally and has been underway since 2008 (USFS, 2009g). Much additional information regarding the strategies, research, and monitoring that is underway in regard to forest sustainability and restoration through adaptation and mitigation is available on the World Wide Web at http://www.nrs.fs.fed.us/niacs/tools/uncertainclimate/.

Two key strategies for addressing climate change include "adaptation" and "mitigation". Adaptation relates to the ability of a system to adjust to climate change, be resistant and resilient to potential damages, to take advantage of opportunities, or cope with consequences. Adaptation can be addressed at the project level.

Mitigation includes strategies to reduce greenhouse gas sources and emissions and enhance greenhouse gas sinks. It is best addressed at a much larger scale than the project level for two reasons. The first reason is because project level effects are too small in terms of affecting change (positive or negative) in the global concentration of carbon dioxide or other greenhouse gases. The second reason is the boundaries of analysis of mitigation measures extend well beyond the CNNF. Substitution of wood products for fossil-fuel-intensive materials and replacement of woody biofuels for fossil fuels are just two examples. A full analysis of greenhouse gas mitigation effects of these activities would be complex and broad. A mitigation assessment, including analysis of many different management scenarios, is currently underway by Forest staff and scientists from the Forest Service's Northern Research Station and the University of Wisconsin. The analysis will include the entire northwoods of Wisconsin. This work will help us better quantify the mitigation gains and/or losses of a variety of measure and management actions.

The adaptation side of the climate change strategy is addressed through the purpose and need for the Park Falls Hardwoods project, as well as through the Forest Plan. The forest health component of the Park Fall Hardwoods vegetation management objectives 2-9 (Chapter 1, Need to Improve / Maintain Forest Health) are designed to promote resistance to extreme weather (i.e., wind, drought) and insect and disease outbreaks; increase stand diversity in terms of species, structure, and tree ages; and increase stand growth and vigor by providing space for trees to grow. Healthy forests are more resilient to changing conditions and more resistant to disease, pests, fire, and extreme weather. These stresses are

likely to increase with climate change. The development of long-lived species adjacent to cold water and / or native trout streams (Chapter 1, Need to Improve / Maintain Coldwater Fisheries) is a proactive approach to protecting the integrity and function of key fish habitats. Allowing the removal of biomass (Chapter 1, Need for Supplying Wood Products) supports one of the climate change mitigation strategies (increasing the use of biofuels), even though it is immeasurable at the project level. Adaptation and mitigation are also addressed through project design features and Forest Plan standards and guidelines, and other ongoing activities within or that encompass the Park Fall Hardwoods project area (covered by broader NEPA). Examples include the protection of federally threatened and endangered species and Regional Forester Sensitive Species, non-native invasive plant species control, and restoration of native plant communities. Impacts of forest management on carbon sequestration at the project level is also addressed (Soil Resource section, Chapter 3). It describes the relationship between forest management and carbon sequestration in soils, and includes references to more detailed supporting information in the project record.

An internal Report entitled, “The Relationship of Carbon Impacts and Vegetation Management on the CNNF”, prepared by Brian Quinn in 2009, provides a comprehensive evaluation of the topic, including references to the most recent science. The most commonly asked questions regarding the relationship between forest management and climate change are addressed. Locally based research also provides additional insight into the Forest’s biological carbon budget (Fassnacht and Gower 1997, Cook et al. 2004, Desai et al. 2005, Noormets et al. 2007). White et al. (2005) and Gower and Ahl (2006) calculated the industrial carbon cycle (including all the emissions associated with timber harvest, transportation and processing) and concluded that even with current harvest levels, the CNNF is acting as an overall carbon sink. Perhaps the most relevant research regarding forest management on the Chequamegon-Nicolet is that of the Chequamegon Ecosystem-Atmosphere Study (ChEAS). Continuing the study at the Willow Creek flux tower (ChEAS tower) with a harvest treatment would help to increase the understanding of the impacts of harvest on the atmospheric flux of carbon dioxide, and provide insight on forest management techniques that could be used to minimize greenhouse gas emissions. Additionally, other studies show that we can expect a net reduction in greenhouse gas emissions from substituting timber products for other materials (for example, cement, steel, and heating fuel that consume more fossil fuels to produce than wood substitutes).

In short, the proposed vegetation management actions are not expected to result in a net increase in greenhouse gas emissions, but when substitution effects are anticipated, they could result in a small offset of other global carbon emissions.

APPENDIX D - RESPONSE TO COMMENTS ON THE PROPOSED ACTION

Table D1 lists those who submitted comments on the proposed action for the Park Falls Hardwoods project. Each commenter is listed along with a numeric comment letter number. Each comment was reviewed and divided into separate sections based on the theme or issue identified. Table D2 shows each comment with a response of how the comment was used in the analysis or a summary of how the issue was addressed. Further information is referenced from the Project File (PF) or from specific sections of the draft Environmental Impact Statement (EIS) as applicable.

Table D1: List/Index of Commenter on Proposal and Comment Number

Name	Organization	Comment Letter #
Dick Artley		15
Duane Baer		31
Pete Bartelt	Forest and Parks Adminstrator, Price County Forestry and Parks	28
David P. Bartz	Habitat Chair, Ruffed Grouse Society, NE WI Chapter	11, 19
Gail Beyer		24
Cordell Brehm		6
Kenneth Brunner		35
Robert Dall	WDNR	1
Paul Delong	Chief State Forester, Division of Forestry, WDNR	33
Ankur Desai	Asst. Professor, Atmospheric & Oceanic Sciences Dept.	14

Table D1: List/Index of Commenter on Proposal and Comment Number

Name	Organization	Comment Letter #
Philip Devins		30
Kathrine Dixon, et al	Staff Attorney, Environmental Law and Policy Center, for Habitat Education Center	26
Robert Engebretsen		18
Jon Gossfeld		2
James Gurtner		8
Jeff & Jennifer Haugh		5
Donald Hendricks		21
Carl D. Jahns		23
Clint Jones		9
Gary Kadlecek		25
Paul Kleinschmidt		22
Jim Landru, Jr.		20
Wayne Lerand		3
Dan Losby		10
Scott Manning	503 Road Association	4, 7
Kenneth Neu		36
Jim Ryf	Little Willow Lodge	13, 29
B. Sachau		16
Douglas Sasse		12
Henry Schienebeck	Executive Director, Great Lakes Timber Professionals Association	32
Jane Severt	Executive Director, Wisconsin County Forests Association	34
Dennis Venzke		17
Gary Zimmer	Senior Regional Biologist, Ruffed Grouse Society	27

Table D2: Comments and Response to Comments on the Proposed Action			
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01	I am supportive of this proposal. I feel it is congruent with goals of the Forest Plan. I have no additional concerns or suggestions at this time. I favor the biodiversity aspects that this proposal sets out to achieve.	Purpose and Need	Supportive comment related to the purpose and need for the proposal.
02	As a land owner in Price County, I am very interested in improving our land for wood harvest and wildlife. If there is anything I can do to help, let me know.	Purpose and Need	Supportive comment related to the purpose and need for the proposal.
03	I fully support the PFH project. The community needs the wood, and it's good for the animals and the forest. Please leave as many roads and trails open for off-road recreation as you can	Purpose and Need	Supportive comment related to the purpose and need for the proposal.
04a	Open FR 131, 132, 136, and 503 to all wheeled vehicles to access feeder roads.	Outside FS Jurisdiction	Jurisdiction for FR 131, 132, 136, and 503 for the requested type of use (all wheeled vehicles) resides with the Town of Emery and not the Forest Service. These roads are currently closed to recreational wheeled vehicles such as ATVs. This issue is outside FS jurisdiction to address.
04b	Introduce elk herd into Management Area. Ideal habitat exists, and added protection from highway vehicle collisions due to the proximity of the area.	Outside FS Jurisdiction	Any elk re-introduction would be under the jurisdiction of the Wisconsin Department of Natural Resources and they have not proposed re-introduction into the Park Falls Hardwoods project area. Any consideration of re-introduction of elk would also include an assessment of elk habitat needs such as large upland openings which do not occur within this project area, nor are their creation compatible with the Forest Plan management direction for this area. Elk re-introduction does not meet the purpose and need for the Park Falls Hardwoods project and is not being considered at this time. For additional information on elk in WI, see the Wisconsin Department of Natural Resources website: http://www.dnr.state.wi.us/org/land/wildlife/elk/questions.htm#10 and Frequently Asked Questions. Also located at this website is the Clam Lake Herd Management Plan which outlines the process used to reintroduce the experimental herd of elk in that location.
05a	Two concerns I would like to address: My family owns a cabin on Federal Forest Road 503, eastside of the road. If log haulers and heavy machinery will be traveling up and down the roads, how will this be handled? The roads will be torn up.	Road Maintenance standard procedures.	Forest Road 503 is a town road of the Town of Emery. The Forest Service has agreements with townships to cooperatively perform road maintenance of town roads. Such cooperation includes engineering services, material sources, or cooperative construction services. Townships receive gas tax monies to maintain town roads under their jurisdiction. Jurisdiction for restricting use on FR 503 resides with the Town of Emery. Town roads used for timber haul will remain open to the public during the life of timber sale contracts. With the exception of road weight restrictions normally imposed during spring thaw, no other restrictions are anticipated. No improvements are planned for FR 503 or other town roads as a result of this project. The Forest Service also collects deposits on all timber sales for the use of roads maintained by the Forest Service. These deposits are used to repair roads where damage is not immediately attributable to timber haul. These deposits are often used to periodically grade roads or replace surfacing materials.
05b	Whoever will be doing the cutting down of trees, we would appreciate it if they would stay back 100 yards from landowner's lot line. The remaining brush on the ground is a fire hazard and an unpleasant sight. Otherwise we agree the forest needs to be "thinned" out.	Standards/ guides/ design measures	Property lines adjacent to proposed timber harvest activity have been surveyed by a Licensed Professional Land Surveyor registered in the State of Wisconsin. When timber harvest occurs adjacent to private property a 10 foot slash removal zone is established against the property line. Beyond this slash removal zone no additional measures are taken to limit visual impacts. Certain roads and trails in the project area have Scenic Integrity Objectives. These areas have guidelines that minimize the evidence of management activities. Adjacent to these

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			routes slash heights are limited to a maximum of 24 inches in height in the visible area up to 100 feet (150 feet for non-motorized use areas) from the route. Forest residue or slash plays an important role in maintaining forest productivity and providing wildlife habitat. Retaining some forest residue is important to limit impacts of timber harvest on biodiversity, soil nutrients, physical properties of soil, as well as water quality. In addition to slash removal and reduction requirements, depending on the alternative and the type of treatment, slash or logging residue would be further reduced by allowing for the removal of topwood or biomass. Whenever and wherever this material is available for harvest the Forest Service will be implementing Wisconsin's Biomass Harvesting Guidelines (BHGs). One of the goals of these guidelines is to average five tons of fine woody debris on site following timber harvest. Implementation of these guidelines will maintain site productivity and allow for continued sustainable harvest from these forest lands. Based on the visual and slash disposal guidelines that would be followed and a review of the fuel types in the project area, an increase in fire hazard is not expected to occur. See Appendix C, Scenic Quality, Public Access and Condition of the Public Motorized Transportation System, and Private Lands sections for additional information.
06	In regard to all projects, it would be nice if you would only select cut woods, not clear cut. Thank you.	Purpose and Need	No issue identified except disagreement with the use of clearcutting as an option for managing vegetation. The alternatives analyzed in detail, including the no action alternative have varying amounts of harvest methods and treatments depending on the alternative objectives, which are described in Chapter 2. Overall, one of the main objectives for the area is to reduce the amount of early successional habitat which is generally the type of habitat (aspen for example) that requires even-aged management techniques such as clearcutting. As described in Chapter 1, maintenance of young aspen is desired in the amount of aspen that remains on the landscape. Optimal regeneration of aspen requires minimal shade from overstory trees, so clearcut harvest methods are used. Also see Chapter 3, Aspen age class.
07a	Please confirm existing permit access drives such as the 503 road association will remain open as currently is the case.	Special Use existing agreements.	Any proposals or decisions associated with this project for changes to general public motorized access do not change or modify private land access that has already been permitted under Special Use Authorities.
07b	Consider adding FR 131, 132, 136, and 503 to be open to all wheeled vehicles 50" or less to access feeder roads.	Outside FS Jurisdiction	Jurisdiction for FR 131, 132, 136, and 503 for the requested type of use (all wheeled vehicles) resides with the Town of Emery and not the Forest Service. These roads are currently closed to recreational wheeled vehicles such as ATVs. This issue is outside FS jurisdiction to address.
07c	Add elk herd into Management Area. The remoteness and terrain of the area should be beneficial and significant distance from major state highways will avoid car collisions as is occurring in the current Clam Lake location.	Outside FS Jurisdiction	Any elk re-introduction would be under the jurisdiction of the Wisconsin Department of Natural Resources and they have not proposed re-introduction into the Park Falls Hardwoods project area. Any consideration of re-introduction of elk would also include an assessment of elk habitat needs such as large upland openings which do not occur within this project area, nor are their creation compatible with the Forest Plan management direction for this area. Elk re-introduction does not meet the purpose and need for the Park Falls Hardwoods project and is not being considered at this time. For additional information on elk in WI, see the Wisconsin Department of Natural Resources website: http://www.dnr.state.wi.us/org/land/wildlife/elk/questions.htm#10 and Frequently Asked Questions. Also located at this website is the Clam Lake Herd Management Plan which outlines the process used to reintroduce the experimental herd of elk in that location.

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08	Like it.	Purpose and Need	Supportive comment. No issues identified.
09	Thank you for seeking public input on this project and proactively soliciting comments. I agree with all of your bulleted project goals except for one. I believe that reducing the amount of early successional forest that would be maintained in the area is a horrible concept. I am in the woods many days in the late summer and fall and have met many people partaking in the use of this area. The majority of the people I have run into are hunting for grouse, woodcock, bear, deer, or bobcat. I am confident that if you surveyed forest users and tabulated the use of their time in the woods, 80+% would be engaged in these activities. It is well known by almost all sportsmen that early successional forests are required to increase habitat and food sources for the above mentioned game. I believe the declining presence of early successional forest puts increased demands on existing early successional forests, decreases hunter satisfaction, reduces land use from hunters in the area which results in decreased revenue to local communities that depend on hunter tourism dollars. There are only a few stands (mostly small) of early successional forest in this area. I live across from one of them and it is not uncommon to see 3-4 different groups of grouse hunters work the same 10 acre stand of 10 yr. old clear cut a day. Most have well trained dogs and groups of hunters number 2-3 on average. Managing such a large area of National Forest for the benefit of only a few species of animals in low density does not seem the best use of land. I believe we should maintain some tracks of hardwoods for their timber and aesthetic value, but I would most like to see intermittent stands of aspen regeneration. I recommend keeping large strips of hardwoods along forest roads for the fall colors and lumber money. Inside of the hardwood strips should be various year classes of aspen regeneration. Please consider increasing the amount of early successional forest. Thanks		Alternatives	Regenerating aspen has been identified in the Forest Plan as a Management Indicator Habitat. Impacts to regenerating aspen (as an indicator for early successional wildlife species) were considered in the analysis. The amount of aspen (early successional habitat) in the MA 2B portion of the project area is around 25% of the upland vegetation (Chapter 1, Reduce the Amount of Early Successional Forest). This is more than double the amount desired (up to 10%) in the 2B area. Because of this, the proposal (Alternative 5) was developed to aggressively address the need to reduce early successional habitat. Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). It takes a less aggressive approach to conversion of early successional habitat to late successional habitat. Because of the age of the existing aspen, none of the alternatives reduce the percentage of aspen substantially. Aspen still remains above 20% of the existing upland in all alternatives (Chapter 3, Forest composition). Also see response to comments 27a and 27b. Also see Chapter 3, Early successional wildlife and Appendix C, Regenerating Aspen MIH.
10	I think it is really good and you people are doing a really good job on doing all of this work to have us enjoy the good work you are doing. But, I am disabled and can't afford having an ATV. On some of these roads that I can get to to fish….do you have a permit for people like us?? Can't walk over 1 block.	Purpose and Need and standard federal procedures for disabled access.	We do not issue permits to drive on roads closed to public use. However, each of the action alternatives includes some increase in roads open to highway legal vehicles. A consideration in choosing many of these roads was access to recreational activities such as dispersed camping, hunting, and fishing. In addition, the Interagency Access Pass is available for individuals with disability. For more information on Interagency Access Pass and specific spots for fishing that are fully accessible, please contact the recreation staff in one of our Forest offices.
11a	I appreciate the opportunity to comment on proposals for this project. Please send me a copy of those proposals. In your cover letter you listed 10 purpose and needs for this project. I offer the following comments on these needs. 1) Measuring impacts of harvest and atmospheric flux on CO2 is a rather waste of money in times of limited budgets	Purpose and Need	Measuring atmospheric flux of CO2 is not a project that is being considered in this analysis. The opportunity for that independent, existing study to continue by harvesting is the proposed project (Chapter 1, Acquire Data on the Impacts of Selection Harvest on the Atmospheric Flux of Carbon Dioxide). The concern identified is still addressed in the analysis through alternatives. Some alternatives include harvesting in the footprint of the study area and some do not so that the tradeoffs between harvesting in the area, or not, are identified (Chapter 3, Understanding the impacts of harvest on the atmospheric flux of carbon dioxide).
11b	2) Ruffed Grouse as well as spruce grouse need to be an "indicator" species for this forest. The reckless management of early successional forest (aspen) is having a very negative impact on ruffed grouse and deer. Therefore, reduction of successional (early) in this project is ridiculous!	Alternatives	Regenerating aspen has been identified in the Forest Plan as a Management Indicator Habitat. Impacts to regenerating aspen (as an indicator for early successional wildlife species) were considered in the analysis. The amount of aspen (early successional habitat) in the MA 2B portion of the project area is around 25% of the upland vegetation (Chapter 1, Reduce the Amount of Early Successional Forest). This is

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	Early successional forest mixed in with hardwood stands increases diversity and doesn't decrease it as many anti-logging groups erroneously promote. This is a National Forest not a National Park.!		more than double the amount desired (up to 10%) in the 2B area. Because of this, the proposal (Alternative 5) was developed to aggressively address the need to reduce early successional habitat. Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). It takes a less aggressive approach to conversion of early successional habitat to late successional habitat. Because of the age of the existing aspen, none of the alternatives reduce the percentage of aspen substantially. Aspen still remains above 20% of the existing upland in all alternatives (Chapter 3, Forest composition). Also see response to comments 27a and 27b. Also see Chapter 3, Early successional wildlife and Appendix C, Regenerating Aspen MIH.
12a	My concern is with the way these loggers leave the tops laying around. I have witnessed many clear cut and select harvests and when they leave the tops it makes the forest ugly and hard to walk through. Are you going to require that they remove everything that they cut down?	Standards and Guides	Certain roads and trails in the project area have Scenic Integrity Objectives. These areas have guidelines that minimize the evidence of management activities. Adjacent to these routes slash heights are limited to a maximum of 24 inches in height in the visible area up to 100 feet (150 feet for non-motorized use areas) from the route. Forest residue or slash plays an important role in maintaining forest productivity and providing wildlife habitat. Retaining some forest residue is important to limit impacts of timber harvest on biodiversity, soil nutrients, physical properties of soil, as well as water quality. In addition to slash removal and reduction requirements, depending on the alternative and the type of treatment, slash or logging residue would be further reduced by allowing for the removal of topwood or biomass. Whenever and wherever this material is available for harvest the Forest Service will be utilizing Wisconsin's Biomass Harvesting Guidelines. One of the goals of these guidelines is to average five tons of fine woody debris on site following timber harvest. Implementation of these guidelines will maintain site productivity and allow for continued sustainable harvest from these forest lands. As a summary, while we do not require loggers to remove all top wood in any alternative because of the benefits that wood and wood decomposition provides to various other resources, Forest Plan guidelines to reduce the visual and travel related impacts of leaving tree tops in the harvested areas would be implemented as a requirement of each alternative. See Appendix C, Scenic Quality.
12b	Are the trucks going to damage roads?	Road Maintenance standard procedures.	Forest Service Timber sale contracts contain provisions that require timber sale purchasers to perform road maintenance commensurate with use. This means that any damage sustained on a road used for timber haul must be repaired by the timber sale operator. The Forest Service also collects deposits on all timber sales for the use of roads maintained by the Forest Service. These deposits are used to repair roads where damage is not immediately attributable to timber haul. These deposits are often used to periodically grade roads or replace surfacing materials. The Forest Service has agreements with townships to cooperatively perform road maintenance of town roads. Such cooperation includes engineering services, material sources, or cooperative construction services. Townships receive gas tax monies to maintain town roads under their jurisdiction. Town roads used for timber haul will remain open to the public during the life of timber sale contracts. With the exception of road weight restrictions normally imposed during spring thaw, no other restrictions are anticipated. No improvements are planned town roads as a result of this project.
13	(paraphrase from phone conversation) I think that the project is worthwhile, especially cold water stream improvements, habitat for spruce grouse and Canada yew.		Purpose and Need — Supportive comment related to the purpose and need for the proposal.
14a	As the principle investigator (PI) of the Chequamegon Ecosystem Atmosphere Study	Purpose and Need	The issue identified in this comment is a common issue for many Forest projects. That is one of timeliness of a project Decision in relationship to a condition to be remedied. The Forest Service is

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	Willow Creek mature north hardwoods flux tower and carbon cycle research site, I am glad to see mention and importance of the project in the proposed action. If it makes sense, it would be nice to include a statement (though I understand they are implied) about 1) expediting the northern hardwoods selection treatment around this area to align with the research timetable,		bound by applicable federal environmental laws and policies including the National Environmental Policy Act (NEPA). This law requires federal agencies to seek public comment and disclose environmental effects of proposed federal projects. Regulations and policy that implement this law set specific requirements and timeframes that must be adhered to prior to implementing any projects. Additional regulations require a public appeal or objection process to occur prior to implementation. And finally, project decisions can be litigated in some instances. The Forest Service is aware of the need for timely decisions so that research funding can be applied for and obtained, and will work towards timely decisions as our laws, regulations, policies, and funding allow.		
14b	2) cooperating and coordinating harvest activities with researcher needs,		Purpose and Need	See Response to 14a. Also, following a decision on the Park Falls Hardwoods project, specific harvest units can be scheduled for implementation according to research needs or other site specific priorities (Appendix E, Table E5, M330)	
14c	3) providing detailed data on management actions for the entire proposed action for carbon cycle and climate change modeling activities.		Purpose and Need	This has been added as a beneficial impact of the study (Chapter 3, Understanding impacts of harvest on the atmospheric flux of carbon dioxide).	
15a	Ranger Hennes, why does the USFS claim that the solution to 95% of the ecological problems (real or perceived) on publicly-owned national forest is logging and road construction? I spent 31 years in the agency. For the last 11 years of my career I was responsible for writing and distributing the Monitoring and Evaluation Report for the Nez Perce National Forest. To gather the information for the Report, I organized and led the 10 member forest ID Team on field monitoring trips to different projects 3 times a year. Members of the team included: •fisheries biologist •wildlife biologist •hydrologist •forest ecologist •soils scientist •range conservationist •botanist •archaeologist •forester •road engineer Many times we monitored commercial timber sales both during and following the logging and road construction. Each member of the forest ID Team wrote-up their individual comments and conclusions about how the timber sale affected their resource and submitted these reports to me. I summarized them into a single summary report for the forest supervisor to review and approve prior to mailing it to the public. Without exception, there was ALWAYS a definite split between the members of the team regarding the timber sale effects to the forested ecosystem. The forester and road engineer sent me very positive reports. The other 8 members of the team felt that their resource had been “damaged”, “harmed”, “hammered” or “destroyed” within the cutting unit boundaries.			FS NEPA Policy and Procedures	This project was developed with an ID Team and the anticipated effects of the proposed actions are described in individual specialist reports which are summarized in the DEIS, Chapter 3. The members of the team are listed in Chapter 4 of the DEIS. The Chequamegon-Nicolet National Forest (CNNF) conducts yearly monitoring, the results of such monitoring can be found in Monitoring and Evaluation Reports. The Forest Service agrees with the commenter in regards to the agency’s obligation to thoroughly analyze all information and opposing science brought forth from the public that relates to the project. The interdisciplinary team reviewed all opposing science brought forth by the commenter. The full review of Mr. Artley’s Attachment 1 is in

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	The fisheries biologist and hydrologist also felt that the sediment caused by the logging operation and road construction had negative effects on the riparian resources many miles removed from the timber sale. Such negative effects of logging and access road construction are supported by the vast majority of independent, unbiased scientists. See science attachment #1. So you see, commercial timber sales NEVER result in a healthier forest. People who think they do either: 1) posses very little knowledge of the total forest ecosystem besides trees, 2) know the Forest Service has a timber culture and desperately want to be promoted in this culture by "getting the cut out" at any cost to the natural resources in a forest, and/or 3) are only aware of "science" written by biased agency employees and members of the timber industry. As you can see from reading the judge's opinions in the 5 court cases below, you must respond to each scientific statement individually. In doing so you have several choices: 1) Tell the public that the opposing science statement does not apply to your project and explain why. 2) Tell the public that the science statement is not true and explain why. 3) Tell the public that the science statement is true and applies to your project; however you choose to ignore it as you plan your project. If this is the case, you MUST explain why. 4) Tell the public that the scientist(s) making statements that oppose your project are not recognized by the USFS as real scientists. If this is the case, you MUST provide the reader with your reasons. I will then email your reasons to the scientist. 5) Tell the public that the science statements have not been peer reviewed. If this is, done, the USFS line-officer must omit all references used to support the project that are not peer reviewed. **Opposing Science submitted by Concerned Citizens must not Be Ignored** The court cases listed below mandate government agencies to analyze and publicly respond to the science that opposes a pending Decision. If, after the analysis, the Responsible Official still opts to ignore the opposing science without a reasonable explanation, the agency is guilty of violating the required NEPA "hard look" requirement. I highly recommend that you read these 5 opinions in their entirety. The links are included after a key quote from the judge's opinion. League of Wilderness Defenders et al. v. Elaine Marquis-Brong . In the United States District Court for the District of Oregon, Judge Ancer L. Haggerty, Civil No. 02-75-HA. April 18, 2003, League of Wilderness Defenders et al. v. United States Forest Service . In the United States District Court for the District of Oregon, Judge Ancer L. Haggerty, Civil No. 04-488-HA. November 19, 2004, and Blue Mountains Biodiversity Project et.al v. Blackwood , 161 F.3d 1208, 1211 (9th Cir.1998). Betty B. Fletcher, circuit Judge. Appeal from the United States District Court for the District of Oregon Ann Aiken, District Judge, Presiding, this direction is clear. Center for Biological Diversity v. U.S. Forest Service, 349 F.3d 1157 (9th Cir. 2003). Donald C. Pogue, circuit court Judge. Appeal from the United States District Court for the District of Arizona, Robert C. Broomfield District Judge Presiding. Friends of the Clearwater et al. v. D. Robert Lohn et al. , In the United States District Court for the District of Idaho, Judge		the project record. In summary the majority of the 96 citations are not applicable to this project for a variety of reasons (i.e. citations were from opinion pieces, not science; citations focused on actions not proposed in this project; comment focused largely on western United States examples that are not relevant to northern Wisconsin ecosystems and terrain; and / or comments focused on Forest Service policy and laws passed by congress).

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	Edward J. Lodge, CV04-384-C-EJL, March 31, 2005. --- The following key excerpt is from Judge Haggerty's 2003 opinion in League of Wilderness Defenders et al. v. Elaine Marquis-Brong . "The EA also violated NEPA by failing to disclose respected scientific evidence running contrary to the BLM's final decision to allow salvage logging, and because it failed to address the differences between the BLM's view of likely impacts and the view of others in the scientific community (including views expressed in the Beschta Report), and failed to take the "hard look" at post-fire issues as required by NEPA. This court has consistently followed the Ninth Circuit's teaching in Blackwood that a forest management agency's failure to discuss and consider the Beschta Report "lends weight to [a plaintiff's] claim that the Forest Service did not take the requisite 'hard look' at the environmental consequences of post-fire logging instead of letting nature do the healing." Blackwood , 161 F.3d at 1213." (pg 18) Link: http://www.lclark.edu/org/nedc/objects/Timber_Basin_Order.pdf --- The following key excerpts are from Judge Haggerty's 2004 opinion in League of Wilderness Defenders et al. v. United States Forest Service. "The Forest Service describes plaintiffs' complaints that other opposing views were ignored as "misleading," because no other "opposing science" is identified "by name" in plaintiffs' memorandum, and a review of articles referenced in Exhibit D of the Brown Declaration submitted in support of plaintiffs' Motion for a Temporary Restraining Order suggests that some identified opinions "are mostly in agreement with the Forest Service's stated view of the role of large woody debris in large fires." Def.'s Cross Mo. Mem. at 25-26. The Forest Service then discusses three publications and quotes certain statements contained within them that could be construed as supporting the Forest Service's position. Id . at 26. This discussion of the publications, provided by counsel during litigation, is a brief example of what should have been provided in the EIS. In light of the need to address other aspects in the present EIS, this court concludes that the Forest Service must provide a reasoned discussion of major scientific objections to the proposed action of removing large diameter trees for the purpose of reducing future fire risk. This reasoned discussion must disclose and analyze the scientific opinion in support of and in opposition to the conclusion that the proposed actions will reduce future fuel loadings in accordance with the National Fire Plan." (pg 25-26) Link: http://www.lclark.edu/org/nedc/objects/flagtail.pdf --- The following key excerpts are from Judge Fletcher's 1998 Circuit Court opinion in Blue Mountains Biodiversity Project et.al v. Blackwood. "NEPA requires federal agencies to prepare an EIS for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C. §4332(2)(C). This requirement serves a dual role: 'It ensures that the agency, in reaching its decision, will have available, and will carefully consider, detailed information concerning significant environmental impacts; it also guarantees that the relevant information will be made available to the larger audience that may also play a role in both the decisionmaking process and the implementation of that decision.' Robertson v. Methow Valley Citizens Council , 490 U.S. 332, 349 (1989). Stated differently, NEPA's purpose is to ensure that "the agency will not act on incomplete information, only to regret its decision after it is too late to correct." Marsh , 490 U.S. [360,] 371 [(1989)]. "In view of this purpose, an agency that has prepared an EIS cannot simply rest on the original document. The agency must be alert to new information that may alter the results of its original environmental analysis, and continue to take a		

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	"hard look at the environmental effects of [its] planned action, even after a proposal has received initial approval." Id . at 374 (citations and quotations omitted)." Link: http://www.ca9.uscourts.gov/ca9/newopinions.nsf/04485f8dcbd4e1ea882569520074e698/075514417bff6d1488256e5a007186d9?OpenDocument --- The following key excerpts are from Judge Pogue's 2003 Circuit Court opinion in Center for Biological Diversity v. U.S. Forest Service. "Use of scientific data: Forest Service EIS failed to discuss and respond to 7 scientific studies casting doubt on Forest Service conclusion that northern goshawks are habitat generalists. The Forest Service received comments during scoping challenging its conclusion. The Draft EIS contained summaries of the comments, but did not specifically mention or discuss the scientific opposition." "[1] The CEQ's regulations delineate the analysis that environmental impact statements must contain. Specifically, the agency "shall discuss at appropriate points in the final statement any responsible opposing view which was not adequately discussed in the draft statement and shall indicate the agency's response to the issues raised." 40 C.F.R. § 1502.9(b). This disclosure requirement obligates the agency to make available to the public high quality information, including accurate scientific analysis, expert agency comments and public scrutiny, before decisions are made and actions are taken. 40 C.F.R. § 1500.1(b)." "In the instant appeal, Appellants contend that the final impact statement fails to (1) include a reasoned analysis of the FWS's and the AGFD's opinion that northern goshawks are habitat specialists; (2) discuss and respond to at least seven scientific studies that cast doubt on the Service's conclusion that northern goshawks are habitat generalists; and (3) respond to comments filed by Appellants and Crocker Bedford, identifying the scientific debate whether northern goshawks are habitat generalists." "Accordingly, we find that the Final EIS fails to disclose and discuss responsible opposing scientific viewpoints in the final statement itself in violation of NEPA and the implementing regulations. We therefore reverse the district court's grant of summary judgment and remand to the district court with directions that it remand the final statement to the Forest Service for further proceedings consistent with this opinion. See Vitarelli v. Seaton , 359 U.S. 535, 545 (1959) (standing for the well-established principle that an agency is generally required to follow its regulations); see also Cal. v. Block , 690 F.2d at 769 ("Agencies are . . . obliged to adhere to the procedures mandated by NEPA.") (citing Vt. Yankee Nuclear Power Corp. v. Natural Res. Def. Council, Inc. , 435 U.S. 519, 549 n.21 (1978)).9 Complete opinion at: http://altlaw.org/v1/cases/166505 --- The following key excerpts are from Judge Lodge's 2003 opinion in Friends of the Clearwater et al. v. D. Robert Lohn et al. "NEPA requires the Forest Service to evaluate objectively and disclose credible scientific evidence that contradicts its proposed course of action. 40 C.F.R. § 1502.9(b) (the agency must discuss any "reasonably opposing view"); Seattle Audubon v. Lyons, 871 F. Supp. 1291, 1318 (W.D. Wash. 1994) ("[the agency] must also disclose responsible scientific opinion in opposition to the proposed action, and make a good faith, reasoned response to it"), aff'd, Seattle Audubon v. Mosely, 80 F.3d 1401 (9th Cir. 1996); see also Seattle Audubon, 798 F. Supp. at 1482 ("[t]he agency's explanation is insufficient under NEPA – not because experts disagree, but because the FEIS lacks reasoned discussion of major scientific objections"), aff'd, Seattle Audubon v. Espy, 998 F.2d 699 (9th Cir. 1993); Silva v. Lynn, 482 F.2d at 1285 ('[W]here comments from responsible experts or sister agencies disclose new or conflicting data or opinions that cause concern that the agency may not have fully evaluated the project and its alternatives, these comments may not simply be		

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	ignored. There must be good faith, reasoned analysis in response.'). "(Pg. 33 of opinion) "Being fully advised in the premises, the Court hereby orders Plaintiffs' Motion for Preliminary Injunction (Docket No. 0 as motion was filed in Western Washington Court File) is GRANTED IN PART. Consistent with this Order, the Court finds the Plaintiffs have established serious questions going to the merits of their NEPA cumulative effects claim, the balance of hardships tips sharply in their favor and at least a fair chance of success on the merits of the NEPA claim, and Plaintiffs have established irreparable harm if an injunction is not granted. Therefore, the request for a preliminary injunction is granted. Because the Court finds the Forest Service is in substantial compliance with applicable statutes and regulations, further timber harvesting in accordance with the Meadow Face Stewardship Pilot Project is enjoined until the Forest Service complies with the requisite NEPA cumulative effects analysis." (Pg. 57 of opinion) Complete opinion at: http://www.landsinfo.org/ecosystem_defense/federal_agencies/forest_service/Region_1 /Nez_Perce_NF/Clearwater_%20District/Meadow%20Face/PI%20Order.pdf ---------- It is no surprise that USFS line-officers take extraordinary measures to conveniently gloss over the science that opposes their proposed project. To clear up any USFS misinterpretation of the court precedent set by these 5 cases, here is what the courts say about how government agencies must deal with opposing science submitted by concerned members of the public. 1) ALL opposing science must be addressed by the USFS. The USFS may not "cherry pick" the opposing science excerpts such that they leave out the most difficult science excerpts to refute. 2) When submitting opposing science, most members of the public include excerpts from the science literature that best portray the feelings of the scientist author about the type of project being proposed by the USFS. The USFS must respond to the exact excerpt submitted by the concerned member of the public, and cannot respond to some other benign statement they find in the same literature. This will become clear if you choose to read the complete court opinions. My specific concerns about your tragic timber sale are listed below.				
15b	**Concern #1** The Purpose of your Park Falls Hardwoods project Violates the Administrative Procedures Act On page 2 of your scoping letter you say: "The primary purpose of the Park Falls Hardwoods proposal is to implement activities consistent with direction in the Forest Plan and to respond to specific needs identified in the project area." Then you say that the Forest Plan states: "The Park Falls Hardwoods project primarily falls within the area defined in the Chequamegon-Nicolet National Forests 2004 Land and Resource Management Plan (Forest Plan) as Management Area (MA) 2B. MA 2B is described in the Forest Plan as having a desired condition as an uneven-aged, northern	Purpose and Need, FS Policy and Procedures	Administrative Procedures Act (APA) has a purpose of providing standards for government agency rule making, keeping the public informed of agency rulemaking and providing for public participation in rulemaking. The Park Falls Hardwoods project is not a rule making process under the APA, nor is it designed to change or amend any agency existing rule. In addition, the Administrative Procedure Act states, "the reviewing court shall hold unlawful and set aside agency action, findings, and conclusions found to be arbitrary, capricious, and abuse of discretion or otherwise not in accordance with law (5 U.S.C. § 706)." The Forest Service considers the Park Fall Hardwoods project to be in accordance with federal laws and regulations. This area was not the first priority for logging as the commenter implies. Over half a dozen vegetation management projects have been developed since the 2004 Forest Plan revision. This project is consistent with the Forest Plan which was developed under the Forest Planning Rule. There are 209,000 acres of MA 2B across the CNNF. As stated in the comment,	

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	hardwood, interior forest." How many other areas on the forest are designated MA 2B? How did you decide that the MA 2B in the Park Falls Hardwoods areas is first priority for logging? I guess that the MA 2B in the Park Falls Hardwoods area has the largest commercial trees. **Concern #2** The Proposed Action of your Project will not achieve your Needs. In addition, some of your Needs were have no Scientific Justification The goals expressed in your Forest Plan are legitimate and appropriate … except for needs E and F. Your Proposed Action is the antithesis of actions that might positively respond to the needs A to D. In fact, your proposed action only responds to so-called need E and F. The following needs are identified in the scoping letter:		the desired condition for the project area is to have an uneven-aged, northern hardwood, interior forest. The existing condition of the forest in this area is even-aged. The Forest Plan includes the Objective 1.4a - Maintain or restore vegetative communities to their desired conditions described in Chapter 3 emphasizing MA's 2B, 4B, and 8C. The proposed action utilizes timber harvest as a method to develop the desired age structure that is currently lacking. This project was developed with an ID Team and the anticipated effects of the proposed actions are described in individual specialist reports which are summarized in Chapter 3. The members of the team are listed in Chapter 4. The utilization of specific harvest methods to achieve the desired conditions were primarily developed by ID Team members certified in silviculture which is the art and application of management of forest components to achieve the desired outcome. While a need to provide a supply of wood products is generally a desired outcome, it is only considered because removal of trees to meet other objectives (like forest health or the desired age structure) results in a marketable product. Other alternatives to the proposal were developed so that tradeoffs such as forest health objectives and demand for forest products and an adequate transportation system can be compared (Chapter 2).
15c	A) Need to Maintain and Improve Forest Health (Forest Plan Goal 1.4) Comment: Logging and road construction never result in a healthier forest. Line-officers frequently use the excuses of: 1) the need to remove trees in overstocked stands, 2) the need to remove trees to achieve a wider range of age classes in even aged stands, 3) the need to create openings by removing trees, and/or 4) the need to create healthy, vigorous forest by removing trees that have been impacted by insects disease and wind damage. There are other, more effective ways to meet the 4 goals above without logging the trees. See science attachment #1 and #4.	Purpose and Need	Logging to remove dead/dying trees from overstocked, spruce decline, and wind damaged forests will result in a healthier more vigorous forest. Creating openings, or small gaps, in northern hardwood forests allow regeneration to establish and develop thereby moving an even-aged forest toward an uneven-aged stand structure which is a primary goal in this project area. Timber harvesting is an effective and efficient method to address the need to improve or maintain forest health. Each of the elements of forest health identified in Chapter 1 of the EIS are described in the vegetation specialist report for each alternative and are summarized in the EIS, Chapter 3. Road construction and reconstruction are connected actions associated with the treatment of some stands since a road system is needed to effectively utilize the resultant wood products. Science attachments #1 and #4 provided with the comment do not provide other, more effective methods to achieve the desired objectives. The full review of Attachments 1 and 4 is in the project record. In summary the majority of the citations are not applicable to this project for a variety of reasons (i.e. citations focused on actions not proposed in this project such as fuel reduction; comment and citations focused largely on western United States examples that are not relevant to northern Wisconsin ecosystems and terrain; and / or comments focused on Forest Service policy and laws passed by congress).

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15d	B. Need to Maintain and Improve Threatened, Endangered, and Sensitive Species Habitats (Forest Plan Goal 1.1) Comment: The best way to adversely affect the habitats of these species is to road and log the area where they are known to exist. See science attachment #1 and #4.	Purpose and Need, TES General Issue.	Roads and logging can have either positive, neutral, or negative impacts on threatened, endangered, and sensitive species and their habitat. The impacts vary depending on location, habitat, and species being considered. The Biological Evaluation (BE) analyzed all threatened, endangered and sensitive species that have habitat and are probable to occur within the Park Falls Hardwoods project area. Eastern gray wolf (*Canis lupis*) is the only species analyzed for which roads had potential impact. There will be no increase or change in maintenance level 3, 4 or 5 roads within the Park Falls Hardwoods project area. The analysis of the impact of roads on wolves is discussed in detail in the BE and summarized in Appendix C, Federally threatened – Eastern gray wolf. Additionally, roads and their impacts on wildlife other than threatened, endangered or sensitive were discussed in the Project File, Wildlife Specialist Report. The effects of logging were analyzed on several plant and animal species within the Park Falls Hardwoods project area. This analysis is detailed in both the Plant the Plant and Wildlife BEs and are summarized in Chapter 3, and in Appendix C.
15e	C) Need to Maintain and Improve Coldwater Fisheries (Forest Plan Goal 1.5) Comment: Duh! Only an idiot would believe logging and new road construction will “Maintain and Improve Coldwater Fisheries.”	Purpose and Need, General Coldwater Fisheries Issue	Maintenance and improvement of coldwater fisheries in the proposed action relates to maintaining long lived tree species adjacent to coldwater streams so that shade and cooler temperatures can be maintained for the coldwater species. It also relates to decreasing vegetation favorable to beaver which also helps maintain shade and cooler water temperatures. Impacts to cold water fisheries are described in Chapter 3, MIS – Brook trout and Aquatic Resources.
15f	D) Need to Maintain or Enhance the Quality of the Recreation Experience (Forest Plan Goal 2.1) Comment: This is another Duh! Ranger Hennes, why do you not understand that recreationists dislike seeing stumps and clearcuts. You must have hundreds of miles of roads on your forest for people who enjoy motorized recreation to use. There are also forest users who prefer to recreate in unroaded areas. Its tragic for you to road-up every non-Wilderness acre of your district for commercial logging and lie to the public by telling them that it “Enhances the Quality of the Recreation Experience.”	Purpose and Need, General Motorized Access Issue	Enhancement of quality recreation experiences specifically addresses additional non-motorized access into ecologically sensitive areas (Foulds Creek) and semi-primitive non-motorized areas (Elk River SPNM). Designation and reconstruction of both of these trails provides multiple opportunities such as fishing, hunting, hiking, and wildlife and wildflower viewing in a non-motorized setting (Chapter 3, Walking trails). One issue the commenter identifies is one of how much motorized access to allow. While the alternatives do not substantially differ in the amount of motorized and non-motorized access provided, all the alternatives reduce the overall road density in the project area (Chapter 3, Transportation). Also, there are 2 non-motorized areas within the project area that would be maintained in all alternatives. While timber harvest is not prohibited within these non-motorized areas, the Forest Plan limits the amount of harvest that can occur within a given time frame as well as places limits on visibility of harvesting (Appendix C, Recreation Opportunity and Scenic Quality).
15g	E) Need for Supplying Wood Products (Forest Plan Goal 2.5) Comment: You propose to log 17, 040 acres or 26.6 square miles. This is a major assault on the American public! Furthermore, there is no law that directs the USFS to “Supply Wood Products” to anyone or any corporation.	Purpose and Need, FS Policy and Procedures	The mission of the USDA Forest Service is to sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations. As the lead Federal agency in natural resource conservation, the USDA Forest Service provides leadership in the protection, management, and use of the Nation’s forest, rangeland,

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	The Organic Act comes the closest. The Sundry Civil Appropriations Act of 1897 stated that the purpose of the forest reserves was for: •preserving a perpetual supply of timber for home industries, •preventing destruction of the forest cover which regulates the flow of streams, and •protecting local residents from unfair competition in the use of forest and range Section 4(a) of the Multiple Use Sustained Yield Act of 1960 states: ''Multiple use'' means: The management of all the various renewable surface resources of the national forests so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output. I have about a dozen polls of the American public that shows they are opposed to logging in the national forests. If you want them, I'll send you these polls. My point is: logging does not "best meet the needs of the American people."		and aquatic ecosystems. Our ecosystem approach to management integrates ecological, economic, and social factors to maintain and enhance the quality of the environment to meet current and future needs. Through implementation of land and resource management plans (forest plans), the agency ensures sustainable ecosystems by restoring and maintaining species diversity and ecological productivity that helps provide recreation, water, timber, minerals, fish, wildlife, wilderness, and aesthetic values for current and future generations of people (National Forest Service Website - http://www.fs.fed.us/plan/). The Chequamegon-Nicolet National Forests 2004 Land and Resource Management Plan (Forest Plan) provides the forestwide direction for managing the CNNF. It includes the Forest Plan Goal 2.5 - Providing forest commodities and contributing toward satisfying demand for wood products and special forest projects through environmentally responsible harvest on National Forest System land. The Park Falls Hardwoods project has been proposed to implement the Forest Plan and Chapter 3 includes a description of the various resources that could be impacted by this project including economic impacts (Chapter 3, Economic / Social Resources). The commenter's main point and referenced polls speak to the multiuse mission of the Forest Service (i.e. large picture policy changes within the Forest Service and National Forest Use and Planning). This comment focuses on Forest Service policy and laws passed by Congress. Since the proposal and alternatives to the proposal include specific projects to implement our Forest Plan, thus on a broader scale policy, the comment is beyond the scope of this project.	
15h	F) Need to Develop and Maintain Capital Infrastructure (Forest Plan Goal 3.1 Transportation Systems) Comment: Under the Proposed Action you do not mention any planned road construction for the project. Why then did you include need F? You know that road construction degrades the public land in many ways. See science attachment #4. If you plan on new road construction but chose to omit it from your scoping letter to make you project appear more ecosystem friendly, your scoping letter is a conscious public deception. This violates the CEQ regulations for implementing NEPA. Excluding an important piece of the proposed action in a scoping letter is definitely not a "diligent effort to involve the public." The goals expressed in your Forest Plan are legitimate and appropriate … except for needs E and F. Your Proposed Action is the antithesis of actions that might positively respond to the needs A to D. In fact your proposed action only responds to so-called need E and F.		FS Public Involvement Policy and Procedures	The Proposed Action did not omit the proposed road treatments; they are described under the proposed road treatments and motorized use section on page 13 of the Proposed Action document sent out for scoping. Proposed road treatments included new permanent construction, temporary construction, reconstruction / maintenance, decommission and conversion to trail and were also shown on the proposed action maps. Scientific attachment #4 is 21 pages of citations and references, much of which is specific to mountainous regions and not necessarily translatable to the landscape of northern Wisconsin (19 citations). Additionally, speeches and letters are not generally regarded as scientific data (1 speech, 2 letters as citations). One particular citation is specific to a Federal Register posting. This posting is specific to the 2001 Roads Rule, and is the basis for travel analysis and the road analysis process incorporated in all

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				project scale analyses on the CNNF, including the Park Fall Hardwoods project. Lastly, the commenter identified no specific instances of adverse impacts caused by the proposed road actions. The comment, "road construction degrades the public land in many ways," is too general for a meaningful evaluation of concerns. Chapter 3 of the draft EIS provides a summary of expected impacts of the proposed road actions and alternatives.
15i	Ms. Higgins, with 155 national forests in America, I spend half of my time commenting on destructive development projects on the Chequamegon-Nicolet National Forest. The natural resources on the public land would function properly if humans would stop trying to manipulate them. With very few exceptions the USFS claims that the solution to 95% of the ecological problems (real or perceived) on the national forest is to log and build roads. If a project meets the USFS agenda of pleasing the timber corporations of America, line-officers will refuse to bother themselves with pesky questions about whether the project really makes ecological sense. Heaven forbid . . . if such critical thinking occurred and a USFS line-officer's project was contrary to the USFS agenda, the line-officer would be branded as a "non-team player." A person must be a team player to be promoted in the USFS. I continue to contemplate why a USFS line-officer refuses to do nothing. After all the temperate forest have done quite well for thousands of years without human "management" (a.k.a. logging). Mark my words, if you propose another tragic project like this, you will receive another comment letter like this. I found out about this project on the FSEEE web page. In the future I will expect to be notified of all pending land-disturbing projects on the Chequamegon-Nicolet National Forest. Clearly, the line-officers on the forest cannot be trusted to do the right thing. Please add me to your mailing list for all documents for public consumption associated with the Park Falls Hardwoods project. I prefer to receive such documents electronically. Sincerely ????????????????			FS Public Involvement Policy and Procedures	The commenter has been added to the mailing list for future mailings regarding this project. The Forest posts NEPA projects on the Schedule of Proposed Actions (SOPA) which is available on a quarterly basis in hard copy and on the world wide web.
16	taxpayers do not want to pay taxes so you can build roads for profiteer loggers. there is absolutely no need for this project but there is a need for untouched, protcted open space. the ugly agencies in our federal govt run each area the taxpaeyrs have tried to save as if they were businesses, not being smart enough to know that a sound ecology helps us all far more than the conrete and mines and logging that they do toruin an area and environment. those trees you are logging make oxygen for us to breathe. those trees stop erosion. The fish streams will be full of silt when you cut so this is a very very stupid move. this park falls hardwood project is typical wall street decimation of ameria - its the same ugly attitude toward decimation	Purpose and Need, General Transportation, Air, and Water Quality Issue			The purpose and need for the project is outlined in Chapter 1. Among other needs, the proposed harvest would move the area towards the desired conditions as outlined in the Forest Plan which complies with the National Forest Management Act of 1976. There are no proposals for mines or concrete use in this proposal or any alternative to the proposal. All alternatives maintain forested areas as forest, except for areas used for travel ways. Project wide, the overall roads mileage is proposed to decline in all alternatives compared to the existing condition (Chapter 3, Transportation). Chapter 3 also provides a summary of expected impacts to soils and water quality from each of the alternatives (Chapter 3, Soils and Aquatic Resources). Based on the analysis and the conditions under which any actions would be implemented, no

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	of america and the american dream.		substantial impacts to water quality are expected in any alternative. Also see Appendix C, Water Quality – Water Runoff and Peak Channel Flows.
17	Good idea.	Purpose and Need	Supportive comment. No issues identified.
18	A thinning cut in much of the project area is long overdue. Next, the Forest Service has to get past the nitwit tree huggers and incompetent Judges. Good Luck!	Purpose and Need	Supportive comment related to the purpose and need for the proposal.
19	Thank you for sending me a paper copy of "Proposed Actions" for the Park Falls Hardwoods Project. I have commented previously on this project but after reading the "Proposed Action" I have more comments. I can support all proposed timber harvest proposals except one. The negative attitudes surrounding aspen clear-cut management by "green" groups whose knowledge of proper habitat maintenance is troubling. The Forest Service response by reducing aspen acreage management is upsetting! Reducing the existing aspen acreage of 6049 acres (25%) to a desired acreage of 0-10% is ridiculous. Grouse/deer have suffered enough! How much hardwood does CNNF really need? Early successional forest scattered in hardwoods doesn't decrease diversity, it increases it. Game and nongame species and many plant species desperately need early successional forest. 2BMA needs more aspen to be more diverse!	Alternatives	Regenerating aspen has been identified in the Forest Plan as a Management Indicator Habitat. Impacts to regenerating aspen (as an indicator for early successional wildlife species) were considered in the analysis. The amount of aspen (early successional habitat) in the MA 2B portion of the project area is around 25% of the upland vegetation (Chapter 1, Reduce the Amount of Early Successional Forest). This is more than double the amount desired (up to 10%) in the 2B area. Because of this, the proposal (Alternative 5) was developed to aggressively address the need to reduce early successional habitat. Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). It takes a less aggressive approach to conversion of early successional habitat to late successional habitat. Because of the age of the existing aspen, none of the alternatives reduce the percentage of aspen substantially. Aspen still remains above 20% of the existing upland in all alternatives (Chapter 3, Forest composition). Also see response to comments 27a and 27b. Also see Chapter 3, Early successional wildlife and Appendix C, Regenerating Aspen MIH.
20	I have concerns about the 29 miles of decommissioned roads as I am a Tribal Member of the Chippewa Nation and may be losing hunting and gathering rights from these roads. Can you tell me if these roads being closed will not restrict my Treaty Rights?	General Transportation and Ability to Exercise Treaty Rights Issue	Specific Treaty Rights (such as the right to hunt, fish, or gather) are not expected to change as all these activities can still be conducted in the project area. The type of access used while doing these types of activities may be different, depending on the location and the alternative. Based on the analysis, road density within the project area would range from 3.15 miles per square mile to 2.74 miles per square mile depending on the alternative, so total road density in the project area could slightly decrease from the current condition, which is the desired condition per the Forest Plan (maximum of 3.0 miles of road per square mile) Overall, roads open to some form of motorized use would increase from the current condition in all alternatives except the no action alternative. No areas are being closed to access by the proposed action or any of the alternatives. The only access change occurring is what areas may be available for foot access or motorized access. See Chapter 3, Transportation.
21	Our property is on the Oneida/Price Cty line between 130-131 to the west. Could you please leave a buffer facing our property? We would appreciate it very much.	Standards and Guides	Property lines adjacent to proposed timber harvest activity have been surveyed by a Licensed Professional Land Surveyor registered in the State of Wisconsin. When timber harvests occur adjacent to private property a 10 foot slash removal zone is established against the property line. Certain roads and trails in the project area have Scenic Integrity Objectives. These areas have guidelines that minimize the evidence of management activities. Adjacent to these routes slash heights are limited to a maximum of 24 inches in height in the visible area up to 100 feet (150 feet for non-motorized use areas) from the route.

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			In addition to slash removal and reduction requirements, depending on the alternative and the type of treatment, slash or logging residue would be further reduced by allowing for the removal of topwood or biomass. See Appendix C, Scenic Quality, Public Access and Condition of the Public Motorized Transportation System, and Private Lands sections for additional information.
22a	No Road Closures. Generations have used these forests, paid for these forests and should have unblocked access in perpetuity. Closures present fire danger which threatens surrounding communities and property owners.	General Motorized Use Issue	Overall, roads open to some form of motorized use would increase from the current condition in all alternatives except the no action alternative (Chapter 2, Alternative 1). No areas are being closed to access by the proposed action or any of the alternatives. The only access change occurring is what areas may be available for foot access or motorized access (Chapter 3, Transportation and Walking trails). Decommissioning or closing of roads would not change the fire danger in an area. Roads closed to the public are still available to fire suppression personnel in the event of a wildfire.
22b	Need to have an “Economic Impact Statement”. All townships, villages, cities and counties need to be allowed “coordination” as they have a stake in recreation and loss of revenue due to lack of use as an off limits forest will have little draw.	General Economic Issue and Impact to Surrounding Communities	The Park Falls Hardwoods project does not propose to make any portion of the project area off limits to public use. Townships, villages, cities and counties are all encouraged to comment on Forest Service land management proposals such as the Park Falls Hardwoods project. It is recognized that land use decisions affect local and regional economies. The Park Falls Hardwoods project was proposed to move the project area towards the desired conditions described in the Forest Plan. Based on an assessment of the existing condition of the project area compared to the desired condition as outlined in the Forest Plan, a need for action was identified. The proposal and alternatives work towards meeting the intended need (Chapter 1, Purpose and Need for Action). We recognize that implementing the direction in the Forest Plan results in resource tradeoffs including the potential for economic impacts. Those potential economic impacts have been considered in the development of this impact statement (Chapter 3, .Economic / Social Resources).
22c	Invasive species are not an exclusive motorized detriment. Horse exclusive areas are quickly infested due to feeds containing seeds which are then spread by the animals.	Livestock Spread of NNIS – Not part of the proposal.	The potential to spread non-native, invasive species as a result of this project has been considered. There are no proposals in the project area to designate or construct horse exclusive areas, though if there were, the potential for livestock to contribute to the spread of invasive species would have been considered. See Appendix C, Non-native, Invasive Species (NNIS).
22d	I support zero closure, as I have seen too much theft of public access and loss of legacy and heritage. My grandfather was born in my county in “1870” and I am offended by this infringement.	General Motorized Use Issue	The Road Analysis Report (RAP) for the project area showed that existing road densities are above the desired road density. The RAP also looked at each specific road segment to identify resource issues and based on these issues a determination was made to limit motorized access to prevent resource damage in the proposal. Based on the analysis, total road density within the project area would range from 3.15 miles per square mile to 2.74 miles per square mile depending on the alternative, so total road density in the project area could slightly decrease from the current condition, which is the desired condition per the Forest Plan (maximum of 3.0 miles of road per square mile). Overall, roads open to some form of motorized use would increase from the current condition in all alternatives except the no action alternative (Chapter 2, Alternative 1). No areas are being closed to access by the proposed action or any of

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			the alternatives. The only access change occurring is what areas may be available for foot access or motorized access (Chapter 3, Transportation and Walking trails).			
23	I have just reviewed the information on the Park Falls Hardwoods Project I am interested in creating opportunity to ride OHM's with my 10 yr old son and 12 yr old daughter is area. Is there opportunity to create single track trails (like a heavily traveled deer trail) for OHM's in this area? These trails offer challenges, reduce speed, and have little visual impact on the area. What do the balloons with numbers indicate? I see several short sections of motorized vehicle roads. Based on the description these are open to travel by off highway motorcycles (OHM). Is it acceptable to use the forest road to connect these?	OHM Trails – Not Part of Purpose and Need for this Project	The Park Falls Hardwoods project area does not lend itself to motorized trail construction due to soil type, slope, and wetlands found within the area. Much of the project area has also been designated as a non-motorized area which precludes any new motorized trail construction. Areas adjacent to the project area that do lend themselves to ecologically sound trail construction have been taken advantage of with the designation of the Flambeau ATV trail system. This 70 mile trail system allows for ATV and motorcycle use. The balloons with numbers that were on the proposal maps display the road identification numbers. Off highway motorcycles (OHM) are allowed on Forest Service roads that are open to all wheeled vehicles 50 inches or less. However, many of the shorter section of Forest Service roads open to this use are connected to town roads that are ATV routes. In the state of Wisconsin, off-road motorcycles are prohibited on town road ATV routes. Information on off –road motorcycle trails can be found at http://dnr.wi.gov/org/land/parks/trails/offroadtrails.html.			
24	Great idea! It's about time! I began visiting this area 75 yrs ago – Sheep ranch was clear. Large tree stumps around. Keep me informed.		Purpose and Need	Supportive comment. No issues identified.		
25a	Good idea! I enjoy hunting and this will enhance the area for grouse, deer, etc.		Purpose and Need	Supportive comment. Information on these species and possible impacts can be found in Chapter 3, Early successional wildlife.		
25b	The walking trails are a great idea. Perhaps they can be maintained. (planted and mowed). I have spent many days in the proposed project area (since the mid-1960s) hunting, fishing, trapping, and just walking, and this sounds like the best project to improve the area that I can recall.		Purpose and Need	Supportive comment. No issues identified, except walking trail maintenance. While the project proposals do not specify methods of trail maintenance, routine walking trail maintenance includes seeding and mowing as needed for soil stabilization and as time and funding permits. If implemented, the non-motorized trails would be added to the annual maintenance schedule of the Medford-Park Falls Ranger District recreation staff.		
26a	The Habitat Education Center, David Zaber, Don Waller and the Environmental Law and Policy Center submit the following comments on the Forest Service's January 6, 2010, scoping notice for the proposed Park Falls Hardwoods Project. Because the scoping notice provides limited information about what resources may be affected by logging and road-building in the Park Falls Hardwoods Project area, our comments will highlight specific legal, scientific and policy issues and questions that the Forest Service should consider and respond to as it develops the Environmental Impact Statement for this Project. The commenters support some aspects of the Park Falls Hardwoods project. We particularly want to commend the Forest Service for taking advantage of a research opportunity to study the impacts of logging on the exchange of atmospheric carbon, using the Willow Creek ChEAS tower in the project area. We also appreciate the Forest Service's efforts to restore native Canada Yew in the project area and to create and maintain large patches of interior forest by transitioning a significant number of acres of early successional forest to longer-lived hardwood species. Finally, we support the Forest Service's efforts to improve recreational conditions in the Park Falls Hardwoods project area by improving habitat conditions along 30 miles of cold water trout streams and by creating hiking trails within semi-primitive non-motorized areas. We hope that the Forest Service will pursue these stated goals in an effective and environmentally responsible way.				General NEPA Policy and Procedures	The DEIS was developed under NEPA, CEQ guidance, and FS guidance for conducting environmental analysis. Two alternatives to the proposed action were developed and analyzed in detail specifically to focus on interior species such as northern goshawk and red-shouldered hawk (Chapter 2, Alternatives

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	Nonetheless, these positive aspects of the Park Falls Hardwoods project are a minor part of the overall project, which consists of cutting 14,511 acres of hardwood habitat to produce 91 million board feet of wood products and potentially 14,000 dry tons of woody material for biomass. We believe that this intensive logging and biomass harvest will have unacceptable direct, indirect, and cumulative impacts on species of concern (including Regional Forester's Sensitive Species); special management areas, including 6B Semi-Primitive Non-Motorized areas, 8F Special Management Areas, and 8G old growth management areas; and other forest resources. The Forest Service must thoroughly analyze all potential impacts of the Park Falls Hardwoods Project to minimize any environmental damage to these and other important resources. In order to reach a result that will protect wildlife habitat and forest ecosystem values, and to fully comply with the National Environmental Policy Act ("NEPA") and the National Forest Management Act ("NFMA"), we encourage the Forest Service to take the following steps: • Take a "hard look" at all of the direct, indirect and cumulative environmental impacts of the proposed timber sale. • Ensure the viability of species of concern, especially forest interior species of concern such as Red-shouldered hawks and Northern goshawks. • Engage in a full consideration of alternatives, including an alternative focused on restoring and improving habitat conditions for forest interior species of concern. We hope that the Forest Service will engage in the full study of the Park Falls Hardwoods proposal required by NEPA and will consider an alternative proposal that will maintain and improve habitat for forest interior species of concern. HEC, ELPC, and the individual commenters bring considerable scientific, policy and legal expertise to this situation, and we would be pleased to sit down with Forest Service representatives in a serious discussion designed to reach a result that is good for the environment and for the people of Wisconsin. **I. The Forest Service Must Take a "Hard Look" at All of the Direct, Indirect and Cumulative Impacts of the Proposed Timber Sale.** In order to ensure that the costs and benefits of the proposed Park Falls Hardwoods timber sale are fully understood, the Forest Service must take a "hard look" at all of the impacts of the proposed logging and road building. Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989). The Forest Service must consider not only the direct and indirect effects of the proposed timber sale itself, 40 C.F.R. § 1508.8(b), but also the cumulative impacts of the proposed timber sale in combination with all "past, present, and reasonably foreseeable future" actions on both public and private lands. Id. § 1508.7. A cumulative impacts analysis for the Park Falls Hardwoods Project must consider the impacts of all past, present and reasonably foreseeable impacts of timber sales, road building, and related actions from throughout the National Forest, not just from a geographically limited project area. As part of the cumulative impacts analysis, the Forest Service should keep in mind the number, volume, and location of timber sales that are being proposed for the Forest. Since the 2003 approval of more than 40,000 acres of logging in the Cayuga, McCaslin, Northwest Howell and three other timber sales, the Forest Service has proposed nearly 70,000 additional acres of logging in the Twentymile, Boulder, Long Rail, Fishbone, Fishel, Medford Aspen, Camp Four, Grub Hoe, Twin Ghost, and Honey Creek-Padus timber sales. All of this activity, along with other past, present, and reasonably foreseeable actions, must be fully and fairly considered as "relevant factors" in the Forest Service's cumulative impacts analysis for the Park Falls Hardwoods Project. Before determining the geographic scope of its cumulative impacts analysis, the Forest Service must look at each of these proposed actions and must expressly state whether (and why) each action is cumulatively related to the Park Falls Hardwoods Project and, therefore, whether that		2 and 3). Direct, indirect, and cumulative impacts of these and all the alternatives are displayed in Chapter 3. Past, present, and reasonably foreseeable actions are considered along with the alternative actions, as is any relevant information concerning impacts from private land activity. Documentation and rationale for impact boundaries used for specific resources can be found in Chapter 3 and in the more detailed specialist reports pertaining to the individual resource in question.

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	action should be included in a full cumulative impacts analysis. Significantly, the Medford-Park Falls Ranger District serves as a "bridge" between the two major units of the Chequamegon-Nicolet National Forest. The Park Falls Hardwoods project area contains some of the best and highest-quality 2B Management Area lands in that bridge area. In taking a hard look at the impacts of proposed logging in the project area and forestwide, the Forest Service should seriously consider the implications for cross-unit movement of all threatened, endangered, and Regional Forester's Sensitive Species affected by the project, particularly species that rely on the interior forest conditions that are characteristic of MA 2B. The fact that the Park Falls Hardwoods project area contains the only 2B lands in the Medford-Park Falls Ranger District warrants a particularly hard look at the impacts of the extensive proposed logging in combination with proposed logging in other 2B management areas across the National Forest. Logging, road building, and development occurring on public and private lands within and adjacent to the Park Falls Hardwoods project area must also be factored into the cumulative impacts analysis. 40 C.F.R. § 1508.7. Private lands within and adjacent to the Forest are becoming increasingly fragmented due to development and logging. (Forest Plan Final EIS at 3-108). Land development and intensive logging on nearby private lands reduces the amount and value of wildlife habitat in those areas, making habitat in the National Forest all the more important for the continued viability of threatened, endangered and Regional Forester's Sensitive Species. The impacts of these and other related activities must be considered.		
26b	We specifically encourage the Forest Service to address and fully consider the following potential environmental impacts in developing the Park Falls Hardwoods Project: **A. Impacts to Threatened and Endangered Species and Regional Forester's Sensitive Species** The commenters support the Forest Service's stated goal of improving habitat conditions for Regional Forester's Sensitive Species (RFSS). The spruce grouse is identified as a primary concern in the Park Falls Hardwoods project scoping notice, and the notice also identifies impacts to Northern goshawks as a preliminary issue, due to the presence of several probable goshawk nests in the project area. It is very likely that other threatened, endangered, and RFSS species will be affected by the proposed logging and road-building, as the majority of the project area consists of the 2B, 8G and 6B designated lands, which provide some of the best available remaining habitat for the sensitive and declining species that rely on forest interior habitat conditions. Yet, not one of the other species representing the 2B-type system is mentioned as a focus of analysis for the Park Falls Hardwoods Project. The Forest Service must fully consider the potential impacts to these species from its extensive proposed logging and road-building. The cumulative impacts requirement is especially important where, as here, the Forest Service's various timber sales will impact species whose viability is in danger. Habitat Education Center v. Bosworth, 381 F. Supp. 2d 842, 853-54 (E.D. Wis. 2005). We ask the Forest Service to fully consider the direct, indirect and cumulative environmental impacts to the following threatened, endangered and sensitive plant and animal species: Eastern Timber Wolf (Canis lupis) Bald Eagle (Haliaeetus leucocephalus) Canada Lynx (Lynx canadensis) American Marten (Martes americana) Northern Goshawk (Accipiter gentilis) Red-shouldered Hawk (Buteo lineatus) Black-backed Woodpecker (Picoides arcticus) Spruce Grouse (Falcipennis Canadensis)	TES Issues	All threatened, endangered, and Regional Forester Sensitive Species that have habitat and potential for occurrence in the Park Falls Hardwoods project area were analyzed. This analysis is detailed in the plant and wildlife Biological Evaluations for Park Falls Hardwoods and is summarized in Chapter 3 and Appendix C. Direct, indirect and cumulative effects were discussed for those species with habitat, potential for occurrence, and potential impact by proposed projects. Detailed information on northern goshawk and red-shouldered hawk with respect to the Park Falls Hardwoods project is provided in the wildlife section of the BE and Chapter 3, Wildlife and includes monitoring results. Please note in the red-shouldered hawk discussion that they are not present in high concentrations on the Park Falls landbase, and in fact have not been located during

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	West Virginia White Butterfly (Pieris virginiensis) Mingan's moonwort (Botrychium minganense) Goblin fern (B. mormo) Blunt-lobed grapefern (B. oneidense) American ginseng (Panax quinquefolius) For Northern goshawks, which are acknowledged to be present in the project area, the Forest Service's analysis should, among other things, specifically answer these questions: (1) How many territories are known from the Medford-Park Falls Ranger District?; (2) How many of these territories are active?; and (3) How many of these active territories successfully produced young in the last monitoring season? The Forest Service should also answer the same questions for Red-shouldered Hawks, which are present in high concentrations on the Ranger District. The commenters note that the 369 acres of aspen clearcuts and regeneration proposed for this project would actually eliminate key nesting habitat for some of these species. Significant harvest of aspen in the older age classes has negative implications for Regional Forester Sensitive Species, particularly Red-shouldered hawk and Northern goshawk. Population viability analyses for both Northern goshawk and Red-shouldered hawk strongly discourage any further losses of habitat in order to protect the viability of these sensitive species on the National Forest.			782 point counts conducted since 2001 (Wildlife BE , Red-shouldered Hawk). Older age aspen on the Medford-Park Falls District is not considered suitable habitat over age 65 because of the advanced decline and amount of open canopy in these stands. Regeneration of aspen provides valuable habitat for prey species for raptors, including ruffed grouse and snowshoe hare.
26c	**B. Impacts to Water Resources** The Park Falls Hardwood scoping notice indicates that the project area contains 30 miles of cold water and native trout streams, including the Thunder Creek system, the Little Willow system, the Elk River system, Sieverson Creek, Silver Creek, and the Fould's Creek system. The Forest Service must fully analyze potential impacts to water quality in the Park Falls Hardwoods Project area to ensure that these water resources are not impaired by the proposed logging and road construction activities. Road construction and timber harvesting have the potential to create adverse impacts to aquatic habitats, including increases in water temperatures, loss of terrestrial food (insects and leaves) used by aquatic organisms and sedimentation caused by stream crossings, heavy equipment, and harvest activities in close proximity to the riparian zone. The Forest Service's analysis should address each of these aspects of aquatic ecosystem and wetland health, including aquatic organisms such as amphibians and reptiles, for which the Forest Service has identified no indicators to date. Any discussion of impacts to water quality and riparian habitat should also identify the acres of proposed logging and miles of road-building activities within Riparian Management Zones in the project area and should fully and fairly analyze the impacts of those activities. In other proposed timber sales, the Forest Service has not fully analyzed impacts to water quality from logging and road construction and reconstruction but has instead asserted that impacts to water quality will be negligible because Best Management Practices ("BMPs") will be applied. (See Twentymile Project EIS at 3-142). If the Forest Service takes this position in the Park Falls Hardwoods Project, the Forest Service must also demonstrate (a) that Wisconsin BMPs are adequate; (b) that they are effective, and (c) that these BMPs will be correctly applied where needed. A thorough analysis of water quality impacts is particularly important given the generally poor quality of water resources throughout the CNNF and the significant percentage of this Project Area that contains important water features.		Water Quality Issue	Water quality is considered in the analysis. Overall, monitoring of Wisconsin State Best Management Practices for Water Quality (BMPs) have found them to be implemented correctly and effective in prevention and reduction of detrimental impacts to water quality. See Chapter 3, Water Quality and Appendix C, Water Quality – Water Runoff and Peak Channel Flows.
26d	**C. Impacts to 6B Semi-Primitive Non-Motorized Areas, 8F Special Management Areas, 8G Old Growth Areas, and other Special Management Areas** We support the Forest Service's decision to limit active management in MA 8E, 8F, and 8G to road decommissioning activities only. The scoping notice for the Park Falls	General Issues Concerning Potential Impact to SPNM areas	As described in the Forest Plan, the CNNF has several standards and guidelines specifically designed to insure that the management activities in and near special management areas complement and help move the areas towards their desired condition.	

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	Hardwoods Project indicates that the Forest Service will conduct at least some logging activities in 6B management areas, although there is no specific number of acres proposed for harvest. Maps of the Project Area indicate that, while no logging will occur within other special management areas (8E, 8F, or 8G), a considerable amount of logging is proposed immediately adjacent to these specially-designated lands, particularly in the Little Willow Creek area. The Forest Service must ensure that its activities, including associated road-building and other maintenance, do not compromise the character of these remote and semi-primitive areas. These areas provide key opportunities for wilderness recreation in the National Forest. They also provide important undisturbed wildlife habitat for sensitive species. The Forest Service must fully and fairly analyze any potential impacts to the character and quality of the 6B, 8E, 8F, and 8G areas in the project area as a result of proposed logging and road-building. In addition to the 6B, 8E, 8F, and 8G MA lands, any future analysis of the Park Falls Hardwoods Project should indicate the present of both existing and candidate Research Natural Areas (RNAs) in the Project Area. Excessive logging and deer browse could cause extensive damage to these special management areas that were designed to provide high-quality research conditions. Any potential impacts to these areas should be disclosed and considered.	and Special Management Areas	For example, the purpose and need for enhancement of quality recreation experiences specifically addresses additional non-motorized access into ecologically sensitive areas (Foulds Creek) and semi-primitive non-motorized areas (Elk River SPNM). See Chapter 1, Need to Maintain or Enhance the Quality of Recreation Experience. Designation and reconstruction of both of these trails provides multiple opportunities such as fishing, hunting, hiking, and wildlife and wildflower viewing in a non-motorized setting. This increased non-motorized access will allow visitors to have increased opportunities for solitude. All proposed activities that had potential to impact 8E, F, G management areas were reviewed early in proposal development and in subsequent reviews and were designed to be compatible with those management prescriptions (PF Need for Change Worksheet for Reference Areas – 8/20/2009 and PF ID Team Meeting Notes – Complementary Management – 6/17/2010).
26e	**D. Impacts of Increased White-Tailed Deer Population Density** The causes and consequences of the current overabundance of white-tailed deer in the project area and throughout northern Wisconsin must also be studied. The current chronically high deer populations are largely the result of landscape composition (particularly young aspen) and predominant patterns of logging in the National Forest. Recurring and large-scale clearcuts are known to contribute directly to deer overabundance. In analyzing environmental impacts from the Park Falls Hardwoods timber sale, the Forest Service must consider (a) impacts to the existing deer population from any proposed aspen clearcuts and (b) impacts to forest conditions as a result of these changes in deer population. Deer at their current high densities are known to act as a "keystone" herbivore within the forests of northern Wisconsin. There is significant literature regarding the impacts that deer have on regenerating forest tree seedlings and understory plant diversity, generally. In particular, deer have curtailed the successful regeneration of northern white cedar (Thuja occidentalis), eastern hemlock (Tsuga canadensis), yellow birch (Betula lenta), white pine (Pinus strobes) and northern red oak (Quercus rubra) across most sites in northern Wisconsin. Wisconsin DNR has noted that (a) cedar and hemlock regeneration are only possible if a deer herd is predicted to be "dramatically lower for at least a ten-year period," and (b) if cedar, hemlock, yellow birch, or Canada yew are present, it is not advisable to manage aspen in the same area due to potential impacts from deer. Indeed, the scoping notice for this project notes that eight out of twelve new Canada yew sites in the project area since 2007 showed evidence of heavy deer browse. The need to comprehensively address impacts from white-tailed deer are especially important given the stated goal of the Park Falls Hardwoods project to regenerate and monitor Canada yew in the project	General Issue on Impacts to Plants as a result of an increase in deer herd.	The Forest recognizes that the Wisconsin white-tailed deer herd was, until recently, at chronically high population levels and we remain familiar with the literature. The Forest continues to acknowledge that deer can play a role in inhibiting regeneration of some tree species which is one of the reasons that the Forest Plan aims to reduce favorable white-tailed deer habitat by creating blocks of interior hardwoods habitats (MA 2B) that would provide less preferred habitat for white-tailed deer. Deer habitat is analyzed in the Wildlife Specialist Report and summarized in the Chapter 3, Early successional wildlife. Overall deer numbers have been reduced in the past couple of years due to the winter of 2007-2008 having a winter severity index of "severe" and a possible increase in predation from an increase in predator populations. The amount of clearcutting has gone down across the Forest while the deer population was going up prior to 2008. With the amount of deer baiting with corn, the State of Wisconsin increasing deer herd goals by 8% statewide, and coupled with numerous mild winters, the very small amount of clearcutting in Park Falls Hardwoods project area cannot be correlated with an increase in deer populations or an increase in browsing. In addition, all alternatives move the project area to an increase in later successional habitat, further reducing any potentially related increase in deer populations due to aspen and other early successional habitat (Chapter 3, Forest composition and Northern hardwood patch size and continuous canopy conditions).

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	area. Deer impacts are massive, already pervasive on the forest, and cumulative in two senses – they are accumulating through time (generally worsening), and they are accumulating across space as cutting elsewhere in the region and elsewhere in the forest boosts local deer populations and consequent impacts of these projects. The Forest Service must fully analyze these potential impacts before proposing to regenerate early successional species in the Park Falls Hardwoods Project.		Also see Appendix C, Mature Northern Hardwood Interior Forest MIH and Regenerating Aspen MIH.
26f	**E. Impacts of Emerald Ash Borer Treatment Strategy** The Park Falls Hardwoods Project scoping notice proposes to log ash trees on 120 acres purportedly to avoid potentially catastrophic impacts of an emerald ash borer infestation. (Scoping Notice at 6). While the commenters generally support necessary salvage logging to address infestation impacts, the Forest Service's emerald ash borer (EAB) treatment strategy is not in this category. As described, the Forest Service's EAB strategy is, in effect, a pre-emptive strike that would reduce numbers of large ash in an attempt to head off an ash borer infestation where none currently exists. (Scoping Notice at 7). From the description provided in the scoping notice, it is unclear whether the treatment strategy would be to remove all ash from designated stands or to only take out large ash through selective harvest. In either case, it is questionable whether the Forest Service's preemptive strategy will actually be effective over the long-term. This aspect of the Park Falls Hardwoods project requires significantly more study and review before it is approved. First, there is no evidence that EAB would be controlled by cutting ash. The Forest Service itself notes that EAB has not been found in the CNNF or its surrounding areas at this time. In fact, there is significant evidence to suggest that logging these stands preemptively would actually increase the risk of invasion by EAB and other pests. High-grading stands for large ash only would leave the remaining trees even more susceptible to infestation, since young ash succumb to EAB more quickly than older ash. Selectively logging ash would also favor EAB by increasing light levels within forest stands. EAB favor ash leaves grown in higher light conditions, exactly the conditions that result from logging and road right-of-way construction and maintenance. Higher road usage following road construction and reconstruction in the project area may also increase the risk of EAB invasion in treated stands. EAB are short-distance dispersers with most long-distance movement being a function of human activity. Fostering human activity in the project area, even for a short period of time, increases the risk of EAB transport and establishment over longer distances into the CNNF. Even with road closures following logging, illegal use and non-motorized use means higher chances of invasion and spread of EAB. Old-age ash habitat is preferred by woodpeckers and other wildlife species. Woodpeckers are a major predator of EAB and consequently play a major role in biological control of this pest. Reductions in live cavity trees, standing snags and coarse woody debris in logged stands would reduce habitat suitability for	General Issue – Impacts from implementing Silviculture Treatments to reduce EAB potential spread.	The Forest is cooperatively working as part of a multi-agency group comprised of regional and state emerald ash borer (EAB) teams. EAB has killed 25 million ash trees in Michigan where it was first found in 2002. In 2008, it was found in the state of Wisconsin. Recent infestations have been estimated to have existed for five years. For this reason, EAB is expected to be found on the Forest in the future either through natural movement of the insect or through wood movement by people. EAB can travel 2-3 miles per year on its own but can travel hundreds of miles via transportation of wood products. The Forest has been working to educate the public of the role humans play in the transfer of invasive species and ways to help prevent the spread of EAB and other species. In addition, to prevent an EAB infestation via firewood movement, the CNNF currently has a closure order restricting the movement of firewood onto the CNNF from any quarantined county or area and /or a distance of more than 25 miles of a CNNF campsite, picnic site or destination. Human use, including Illegal use and non-motorized use, of National Forest lands will continue regardless of any decision made on this project. To prevent an EAB infestation silviculturally, The Ash Management Strategy for the CNNF, signed on June 5, 2009 by the Forest Supervisor directs staff to design vegetation treatments that will reduce potential EAB food source (ash phloem). Silvicultural treatments will be most effective if applied prior to an infestation. Reducing the amount of phloem in the stand is expected to reduce the potential build-up of local EAB populations. This is a "slow the spread" approach. The strategy will be applied on all upland mixed hardwood stands and selected key lowland hardwood stands (with a black ash component). The objective is to reduce the phloem in upland and only a small selection of **key** lowland stands thereby affecting the potential population build-up and allowing natural predators to play a role in reducing EAB populations while also providing more time for other possible treatments and / or strategies.

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	woodpeckers, thereby fostering higher populations of EAB. Perhaps most important is the detrimental impact that high-grading ash stands will have on genetic diversity and the implications that this shift would have for future potential resistance to EAB infestation across the CNNF. High-grading stands has the potential to cause genetic drift in the local population of ash. The Forest Service must consider the potential for loss of genetic information in ash and its implications for disease resistance following logging. This is the first proposed preemptive EAB treatment that the commenters have seen in their experience commenting on land management proposals in the Chequamegon-Nicolet National Forest. For all the reasons set out above, this experimental strategy warrants thorough, in-depth analysis and its effectiveness should be verified by research and on-the-ground tests before it is broadly applied.		These stands are not pure ash stands, nor will they be high-graded to remove all large trees, or all ash trees (Chapter 1, Implement a Treatment Strategy to Reduce or Slow the Spread of Emerald Ash Borer). Standard silviculture treatment guidelines will be applied to maintain adequate residual basal areas, encourage a diversity of species and reduce EAB's food source. These guidelines also include the retention of snags and coarse woody debris in the logged stands to maintain habitat (for wildlife) such as woodpeckers that do have the potential to reduce EAB or other insect larvae in an area. Research shows that once a healthy ash stand is infested, one can expect 100% mortality on all ash trees greater than 1.0 inch diameter within six years (Forest Service 2009). See Chapter 3, Ash composition and forest resiliency to emerald ash borer.
26g	**F. Impacts of Logging-Related Activities, Including Road Construction and Reconstruction and Biomass Harvest** While many impacts from timber sales come from the logging itself, the related construction and reconstruction of roads can also have significant impacts, which must be studied. Road construction, reconstruction and use can have many pervasive and cumulative effects, fragmenting habitat, increasing sedimentation in forest streams and other waterways, enhancing the distribution and spread of many already common and often invasive nuisance plants and animals, and contributing to declines of many species sensitive to human disturbance. The Park Falls Hardwoods Project is supposed to involve 12 miles of permanent road construction, 1 mile of temporary road construction, and 43 miles of road reconstruction. The impacts of such construction and reconstruction, and the continued use of those roads, must be considered. Because of fragmentation effects, such consideration must focus not only on total road density, but also on the spatial arrangement of the roads in the project area.	General Issue of potential fragmentation of habitat	The direct, indirect, and cumulative effects of transportation on other resource areas are discussed in the appropriate specialist reports pertaining to those effects and are summarized in Chapter 3. The Forest acknowledges that road densities can provide a mathematical concept for adequate access, or whether a transportation system falls within acceptable limits, but fails to illustrate spatial arrangement regarding site specific access needs. The Park Falls Hardwoods Roads Analysis (RAP) was developed for this purpose. As part of the Park Falls Hardwoods RAP all existing or proposed maintenance level (ML) 1 and 2 roads within the project area are reviewed and numerically rated based on risks and values. Risk categories for rating each road are: aquatic/water quality, non-native invasive plants, plant and animal threatened and endangered species (TES), invasive species, soils and access. The ranking criteria take into consideration spatial layout. It is based on number of occurrences, percentage of road affected, or distance from roadway to occurrences. A visual comparison of the layout between the existing transportation system against the proposed and/or alternative future transportation system was completed. It shows that all of the action alternatives would result in an arrangement which results in less fragmentation. This is due to the lower total road densities, and the decreased spatial concentration of roads from decommissioning. See Chapter 3, Transportation and Appendix G, Alternative Road System Maps.
26h	Futhermore, the Park Falls Hardwoods scoping notice indicates that the proposed activities will produce potentially 14,000 dry tons of topwood material for biomass.	General Issue of	Biomass harvest and the potential impacts have been analyzed and are documented in Chapter 3 and in other supporting

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	Yet, at no point has the Forest Service indicated that it will take a hard look at the impacts of its proposed biomass harvest on soil quality, water quality, aquatic ecosystems, and habitat conditions for Regional Forester's Sensitive Species in the project area. The commenters note, first, that the 2004 Chequamegon-Nicolet National Forest Plan does not address or otherwise anticipate biomass harvest activities; therefore, the Forest Service has presumably done no comprehensive forestwide analysis of the potential impacts of the major new push for biomass harvest on CNNF lands. At the very least, the Forest Service must analyze these impacts at a site-specific level in its environmental impact statement for the Park Falls Hardwoods Project.		potential impacts from biomass harvest.	documents by resource report. Alternatives to the proposal were developed that have less biomass harvest than the proposed action so that any meaningful differences in impacts could be compared and disclosed. See Chapter 2, Alternative Comparison Table. Also see Chapter 3, Northern goshawk, Red-shouldered hawk, General wildlife – Coarse and fine woody debris, Soils, and Demand for wood products.
26i	Biomass harvest has the potential to significantly alter ecosystem conditions on the CNNF. For decades, the Forest Service has maintained that leaving enough tree tops and slash on logged areas would be sufficient to fill all the functional roles filled by coarse woody debris, which has been found historically at low levels across the CNNF. Despite the fact that fine woody debris functions differently than coarse woody debris within a forest ecosystem, the Forest Service has justified removal of all large logs from logging sites on this false assumption. Now, without any forest-wide analysis, hundreds of additional acres will have significant levels of topwood and slash removed from the site that would previously have been left behind. In the absence of revisions to the Forest Plan that would take these forest-wide impacts into account, the Forest Service must take a serious look at proposed biomass harvest at the level of the Park Falls Hardwoods Project.		Standards and guides	A serious look at biomass was made in the Wildlife Specialist Report and additionally in the wildlife Biological Evaluation (BE) in order to determine impacts to wildlife from harvest of this material. See response to 26h for additional resource impacts that were considered with biomass harvest. It is incorrect that the Forest Service maintained leaving tops and slash would fill all functional roles of coarse woody debris and also incorrect that all large logs would be removed. In fact, in the Park Falls Hardwoods project, along with all projects on the Forest, there are several standards and guidelines to provide coarse woody debris (Forest Plan page 2-14 and 3-11) which would be implemented in all alternatives (Appendix E, Table E5, G118, G120-G123, G389, and G394-G396). Additionally, for Park Falls Hardwoods EIS, specific mitigation for biomass harvest calls for the retention of one out of every 10 tops, and 1 out of every 7 tops in aspen clearcuts (Appendix E, Table E5, M16a and M16b). These tops would remain on site. In most of the alternatives, there is only a small amount of biomass harvest allowed (Chapter 2, Alternative Comparison Table). These measures meet or exceed current Wisconsin Forestland Woody Biomass Harvesting Guidelines (BHGs). Contrary to the commenter's statement that "coarse woody debris has been found historically at low levels across the CNNF", recent monitoring and data collection (651 plots in 63 stands over 4,500 acres) shows that there is sufficient coarse woody debris within the Park Falls Hardwoods project area. Our data shows an average of 8.4 tons/acre and 241 pieces/acre of coarse woody debris in hardwood stands greater than 50 years old, which exceeds the average amount of coarse woody debris across the Forest, with the range from 2.9 to 23.5 tons/acre in Park Falls Hardwoods (PF Wildlife Specialist Report).
26j	**II. The Forest Service Must Ensure that the Viability of Species of Concern Will Not Be Threatened.**	Goshawk/ Red-Shouldered Hawk Issue	All threatened and endangered species, along with all Regional Forester Sensitive Species (RFSS), that have habitat and potential for occurrence in the Park Falls Hardwoods project area were analyzed for this project. This analysis is detailed	

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	The NFMA regulations expressly adopted by the 2004 Chequamegon-Nicolet National Forest Plan require the Forest Service to ensure that the continued viability of Regional Forester's Sensitive Species will not be threatened. In order to evaluate these viability issues, the Forest Service should obtain for each species and population up-to-date information on life history, population trends within the CNNF and the region, and factors limiting population growth or threatening population stability. A review of such information suggests that there are serious concerns about the viability of Northern goshawks, which are likely present in the Park Falls Hardwoods project area, and other forest interior species. Several bird species that are associated with older forests are declining in the region and across the Forest itself. Data gathered by the Natural Resources Research Institute and the Wisconsin Checklist Project reveal that many key species of birds in the region are declining. The most recent update of Chequamegon-Nicolet monitoring found that 16 bird species had declined while only five increased, noted that "widespread declines . . . are mainly found in mature forest habitats," and concluded that it "would be prudent to curb further reductions in average forest patch sizes and age on the landscape." These viability concerns are escalated by the likely insufficiency of the Forest Service's 30-acre no logging and 330-foot restricted logging goshawk and red-shouldered hawk nest buffers. The most up-to-date research efforts on goshawk in Wisconsin are only now beginning to test and monitor the efficacy of the nest buffer standards. Studies show that, from year to year, goshawk and red-shouldered hawks move their nests as much as 400 meters. A buffer of at least 124 acres is needed to accommodate such a move. In addition, this limited buffer ignores the need to protect post-fledgling areas (which range from 296 to 593 acres) and foraging habitat (which ranges from 4942 to 5930 acres) for goshawks and red-shouldered hawks. Finally, such buffers have proven insufficient to protect goshawk nests from predation, which is a significant problem in fragmented forests such as the Chequamegon-Nicolet. To comply with NFMA's viability requirement, the Forest Service must fully analyze the issues discussed above to ensure that the Park Falls Hardwoods Project and other past, present, and reasonably foreseeable logging and road-building activities in the Chequamegon-Nicolet will not threaten the viability of Red-shouldered hawks and Northern goshawks. Moreover, the Forest Service must adequately monitor populations these species, which are listed as Management Indicator Species ("MIS") under the		in the plant and wildlife Biological Evaluations (BEs) and is summarized in the EIS, Chapter 3. Direct, indirect and cumulative effects were discussed for those species with habitat, potential for occurrence, and potential impact by proposed projects. Cumulative effects analysis evaluated past, present and reasonably foreseeable proposed projects. See Chapter 3, Northern goshawk for expected impacts to goshawk by alternative. Additionally, woodcock and golden-winged warbler, both birds with large population declines, are discussed in the Wildlife Specialist Report and summarized in Chapter 3, Early successional wildlife. All analyses utilize the best available science at the time of analysis. Management Indicator Species (MIS) are analyzed in the BE and MIS Reports for the Park Falls Hardwoods project. Monitoring efforts and trends are documented in these documents and Chequamegon-Nicolet Monitoring and Evaluation Reports. Alternative 3 (Chapter 2, Alternative 3) was developed specific to this commenter's concerns and includes an additional nest buffer for northern goshawk (see response to comment 26k). There has been considerable study of the goshawk and red-shouldered hawk on the CNNF and nests of these species have been protected through buffer zones in which timber harvesting activities are limited or prohibited. Tom Erdman, who has studied goshawk in northern Wisconsin for approximately 30 years, stated that the 20-acre reserve areas (as under the 1986 Nicolet Forest Plan) work, and that the protections afforded to the species under the revised Forest Plan (2004 Forest Plan) would do even better (Erdman 2003). Similarly J. Jacobs (2006 pers. comm.) considers the buffers that have been used to protect red-shouldered hawks on the Nicolet to be beneficial. The 2004 Forest Plan guidelines for nest buffers for these species were expanded to a minimum of 30 acres with an additional buffer of 330 feet limiting land use activities (Forest Plan pp. 2-20 to 2-21). The Wisconsin Department of Natural Resources has adopted the current 30 acre minimum buffer as standard operating procedure for goshawk and red-shouldered hawks on the lands they administer (Woodford 2005). We are unaware of any scientific literature that supports that a 124 acre buffer would better protect nest sites than our current 30 acre buffer with an additional 330 foot buffer of activity restrictions (total of 68 acres). Literature from across North America indicates that goshawk and red-shouldered hawk have habitat preferences that go beyond 1) forest type, 2) age of the stand, and 3) canopy cover. The CNNF is familiar with this literature and chose the above 3 variables because they are assumed to represent the larger suite of variables (including tree height, stand basal area, amount of large woody debris and snags) that have been shown to be related to the species' habitat preferences. Different forest types are defined by the tree species diversity within the stand. The age of the stand is correlated with the height of the trees and is

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	2004 Forest Plan. Prior to approving the Park Falls Hardwoods Project, the Forest Service must adequately account for how MIS population trends are being affected by logging in the CNNF, as it is required to do under the 2004 Forest Plan, in order to ensure that the proposed logging and road-building do not compromise the health of the Forest ecosystem. In the absence of rigorous population monitoring, the Forest Service must base any assessment of population viability for on a complete and accurate estimation of suitable habitat available for these species. Sierra Club v. Marita, 46 F.3d 606, 621 (7th Cir. 1995); Idaho Sporting Congress, Inc. v. Rittenhouse, 305 F.3d 957, 971-73 (9th Cir. 2002). The Forest Service must ensure that it considers all factors that are relevant to the suitability of habitat. For Northern goshawk and Red-shouldered hawk, for example, relevant factors include: canopy closure, tree height, stand basal area, tree species, open understories, size and amounts of coarse woody debris and standing snags, tip-up mounds, slope, predators, fragmentation, edge, and patch size, and/or proximity to water (for Red-shouldered hawk) or human disturbances (for Northern goshawk). In evaluating factors relevant to the suitability of habitat for these sensitive hawk species, the Forest Service should also consider post-fledgling areas and foraging areas, not just nesting habitat. Such areas are typically larger than the nesting habitat, but are critical to a species' survival. These elements must be factored into the habitat suitability model that the Forest Service is using as the basis of its cumulative impacts and viability analyses.		expected to be correlated with the amount of accumulated large woody debris (LWD) and snags within the stand such that older stands have more of these elements. It is recognized that the relationships between stand age and these other variables may not be linear but they are positive (height: Carmean et al. 1989; LWD in 40+ year old stands: Gore and Patterson 1986). The outcome of a review of the literature resulted in setting an age cut-off (50 years) by which time it is expected that the tree heights and diameters, and LWD accumulation have exceeded the minimums suggested in the literature for these species. For both species, but particularly for the red-shouldered hawk, canopy closure was an important variable in determining the suitability of habitat such that greater canopy closure is better for the species. In an analysis of the habitat currently being used by these species on the CNNF, 80% emerged as an appropriate threshold for canopy closure and it is consistent with the habitat use of these species elsewhere in North America. Additional variables such as slope, the density of predators, the amount of tip-up mounds in the stand, a fragmentation metric, patch size either could not be included in a habitat model because no data exists or, if included in the model, any threshold (e.g., minimum patch size) built into the model would have been poorly linked to the biology of these species on the CNNF. Utilizing new information from Woodford et al (2008) paper on red-shouldered hawks, an analysis was conducted to evaluate if proximity to water could be a useful criteria in order to refine the red-shouldered hawk suitable habitat model. The results showed that incorporating a distance to water criteria into the current red-shouldered hawk suitable habitat model resulted in a less than 4% change in acres of suitable habitat at the 68% confidence interval. At higher confidence intervals the amount of change was slightly over 1%. From these results it was determined that such small differences between the models is an indicator that wetland resources are well distributed in the landscape in the vicinity of stands currently considered red-shouldered hawk habitat (St.Pierre, Schmidt & Eklund Oct 2008 unpublished report). In the modeling of suitable habitat availability on the CNNF for RFSS/MIS, the best available scientific information was considered and as new scientific information continues to become available it is reviewed and habitat modeling on the Forest will integrate the new science appropriately. The primary concern with effects of forest management on forest raptors (goshawk, red-shouldered hawk) has been on disturbance to nesting individuals rather than impacts to habitat. This emphasis is evident in the Forest Plan, which provides guidelines for limiting land-use activities within at least 30 acres surrounding the nest to actions that do not reduce canopy closure and limit human activities during the breeding period (Feb 15th to August 1st). A secondary nest protection zone limits activities to uneven-age management of their habitat with an emphasis on high canopy closure (minimum of 80%).

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			Post-fledgling and foraging areas are best with a matrix of habitat types to provide for an array of prey species. For foraging and post-fledgling areas, studies conducted in the Western Great Lakes region (Roberson et al 2003, Curnutt 2009), show goshawk to be a prey generalist or opportunist, but ruffed grouse and rabbit/hare species were the top prey species along with red squirrels. Statements such as "evidence that at least some goshawks in Minnesota rely heavily upon ruffed grouse" and "Rabbits and hares are used extensively by goshawk" (Roberson et al 2003) support the contention that some habitat management for these species would be beneficial to goshawk within the project area. Park Falls Hardwoods provides and maintains a mix of habitat types across the project area in all alternatives (Chapter 3, Northern goshawk and Red-shouldered hawk).	
26k	**III. The Forest Service Must Consider a Full Range of Alternatives, Including an Alternative Focused on Restoring and Improving Habitat Conditions for Species of Concern.** NEPA also requires that the Forest Service "rigorously explore and objectively evaluate" reasonable alternatives to the proposed timber sale. 40 C.F.R. 1502.14(a). This alternatives analysis is the heart of the NEPA process. DuBois v. U.S. Dep't of Agriculture, 102 F.3d 1273, 1286 (1st Cir. 1996). In order to comply with this requirement, the Forest Service should objectively evaluate an alternative that contains elements that would help to restore and improve key habitat for forest interior species of concern throughout the project area. Based on the discussions above, this "Habitat Improvement Alternative" should have the following basic components: 1) Defer all proposed selection logging and biomass harvest in hardwood stands over 80 years of age, to promote continued progress toward "old growth" habitat conditions, including high levels of downed woody debris. 2) Limit preemptive Emerald Ash Borer treatment to an experimental area sufficient for monitoring the effectiveness of this strategy before it is broadly applied. 3) Eliminate all proposed aspen clearcuts and regeneration within 30 meters of Canada Yew sites to reduce amounts of new forage for white-tailed deer. 4) Defer all logging within 124 acres of historic or current goshawk or Red-shouldered hawk nest sites. 5) Eliminate proposed logging within 30 meters of any stream, lake, or other water body in the Project area, except to facilitate succession to longer-lived species. 6) Close and decommission additional roads in the project area, and reduce the amount of proposed road construction, particularly in Riparian Management Zones. * * *		NEPA Policy and Procedures and Alternatives	Since the specific criteria for an alternative are listed in this comment letter, and those criteria are somewhat responsive to the purpose and need for the Park Falls Hardwoods project, they were used in the development of Alternative 3 as follows: Selection harvest in stands over 80 years old were eliminated from Alternative 3 (based on age in 2010). All biomass harvest in the remaining selection harvest areas was also eliminated from this alternative. Lowland hardwoods over 80 years of age were also deferred from treatment in Alternative 3 which reduced the amount of treatment related to EAB. There are no proposed aspen clearcuts or aspen regeneration treatments within 30 meters of Canada yew sites in Alternative 3 or any other alternative. There is no timber harvest within 124 acres of goshawk nests in Alternative 3. There are no red-shouldered hawk nest sites in or near the project area. Wisconsin's Forestry Best Management Practices for Water Quality (BMPs) would be implemented with all alternatives including Alternative 3 which facilitates succession to

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	This NEPA process presents the Forest Service with the opportunity to carry out a thorough analysis of the needs in the Park Falls Hardwoods project area and the Forest in general, to examine alternative ways to address those needs, and to carefully evaluate the impacts of such alternatives. We look forward to working with the Forest Service to develop a proposed action that will best protect the critical interior forest habitat found in the Park Falls Hardwoods project area and to ensure that the high-quality analysis required by NEPA is carried out. References: Jacobs, J. 2002. Red Shouldered Hawk Reproduction Monitoring for Nicolet National Forest at 38. (noting that the "change of natural forests to industrial forests of aspen regeneration and pine plantations" is a factor in the decline of red-shouldered hawk breeding populations). Allan, J. D. et al. 2003. Influence of streamside vegetation on inputs of terrestrial invertebrates to salmonic foodwebs. 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Biotic and abiotic factors affect Green Ash volatile production and Emerald Ash Borer feeding preference. Environmental Entomology. 38(6): 1756-1764. The borer has spread in North America through a combination of diffusive range extension, associated with local flights, and by long-distance "jump" dispersal associated with human movement of infested sapling or contaminated firewood. Probability of infestation was inversely related to distance from borer epicenters but positively related to the size of human population centers. Muirhead, J.R., et al. 2006. Modeling local and long-distance dispersal of invasive emerald ash borer Agrilus planipennis (Coleoptera) in North America. Diversity and Distributions. 12(1):71-79. Lindell, C.A. et al. 2008. Factors influencing woodpecker predation on Emerald Ash Borer. Ledig, F.T. 1992. Human impacts on genetic diversity in forest ecosystems. Oikos. 63:87-108. Saunders, S. C., M. R. Mislivets, J. Q. Chen, and D. T. Cleland. 2002 Feb. 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See also the 2004, 2005, and 2006 Annual Update Reports. Rolley, R., Wisconsin Checklist Project 2005.		longer lived species adjacent to water. There is no proposed road construction in riparian management zones in any alternative. Because of the reduced harvest in Alternative 3, total road construction is reduced in this alternative. In addition, Alternative 3 eliminates treatment of isolated areas that would have required road construction, further reducing the amount of road construction in this alternative. There were also some additional roads identified for decommissioning in this alternative. See PF 02/23/2010 and 03/17/2010 ID Team Meeting Notes and Chapter 2, Alternative 3. Also see Chapter 3 for comparison of various impacts by the alternatives, including potential impacts to northern goshawk and red-shouldered hawk.

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	Danz at 15. Woodford, J., 2006. Forest Management Guidelines and Monitoring for Northern Goshawks. Wisconsin Dept. of Natural Resources. Jacobs, J. and E. Jacobs. 2004. Annual Report of Reproduction for Red-shouldered Hawks for Northeastern and Central Wisconsin. Graham, R., et al. 1994. Sustaining Forest Habitat for the Northern Goshawk: A Question of Scale. Studies in Avian Biology 16:12-17. Erdman, T., 1996. Goshawk Nesting Survey in Northeastern Wisconsin. Donovan, T., et al. 1997. Variation in Local-Scale Edge Effects: Mechanisms and Landscape Context. Ecology 78(7): 2064-75; Keyser, A., Hill, G. and Soehren, E. 1998. Effects of Forest Fragment Size, Nest Density, and Proximity to Edge on the Risk of Predation to Ground-Nesting Passerine Birds. Conservation Biology 12(5): 986; Flashpoler, D., Temple, S. and Rosenfield, R. 2001. Species-Specific Edge Effects on Nest Success and Breeding Bird Density in a Forested Landscape. Ecological Applications 11(1): 32-46. See, e.g., McLeod et al. 2000. Red-Shouldered Hawk Nest Site Selection in North-Central Minnesota. Wilson Bull., 112(2):203-213; Moorman, C. and Chapman, B. 1996. Nest-Site Selection of Red-Shouldered and Red-Tailed Hawks in a Managed Forest. Wilson Bull., 108(2):357-368; Portnoy, J. and Dodge, W. 1979. Red-Shouldered Hawk Nesting Ecology and Behavior. Wilson Bull., 91(1):104-117; Crocker-Bedford, D. C. 1990. Goshawk reproduction and forest management. Wildl. Soc. Bull. 18: 262-269; Roberson, A., Andersen, D., and Kennedy, P. 2003. The Northern Goshawk (Accipiter gentiles atricapillus) in the Western Great Lakes Region: A Technical Conservation Assessment, available at http://www.cnr.umn.edu/fwcb/CO-OP/projects/goshawk/GoshawkConservationAssessment2004.pdf. Clint W. Boal, David E. Andersen, and Patricia L. Kennedy, Home Range and Residency Status of Northern Goshawks Breeding in Minnesota, The Condor 105:811–816 (2003); Graham, R., et al. 1994. Sustaining Forest Habitat for the Northern Goshawk: A Question of Scale. Studies in Avian Biology 16:12-17.			
27a	The Ruffed Grouse Society appreciates the opportunity to comment on future management activities on the Medford/Park Falls Ranger District of the Chequamegon/Nicolet National Forest. These comments are in response to your 6 January 2010 request for input to the Park Falls Hardwoods Project. The Ruffed Grouse Society recommends that the District reconsider the proposed action under which 1,489 acres of early successional forest habitat is proposed for conversion to other species, most notably northern hardwoods, already in the higher end of the Management Area (MA) 2B desired condition range. This conversion constitutes approximately 20 % of the existing aspen acreage in the project area; an amount we feel is excessive for this area at this time. The proposal places high emphasis on the reduction of early successional acreage in the Project Area to better meet MA 2B goals but must take into account the steadily declining early successional levels across the Forest. The Society and others have repeatedly identified the decline of this early successional forest component as a significant long term concern on the District, the entire National Forest and around the Lake States. During the past 18 years, aspen forests in Wisconsin have declined by 265,000 acres. Since the mid-1960's, the total area of aspen in Michigan, Minnesota and Wisconsin, which contains 80 percent of the aspen in the Eastern US, has decreased by 21 percent (Leatherberry and Spencer 1996). With the reduced harvests occurring on private land, the Wisconsin National Forests may provide one of the last opportunities to maintain a significant early successional component on the landscape. Passive management is occurring across most ownerships and the result is a continuation of the reduction of early successional habitats. Even in this proposal there are plenty of reasons given for not maintaining early successional habitats (i.e. no harvest activities proposed in the eastern half of 6B, no management in MA 8 areas or near cold water fishery areas, as well as expected restrictive standards and guidelines). Due to these and other factors, the Society and others remain concerned that the decrease in early successional acreage is occurring at a level higher than called for in the Forest Plan. This decrease has been observed on nearly all recent projects	Alternatives and Early Successional Species Issue.	The amount of aspen (early successional habitat) in the MA 2B portion of the project area is around 25% of the upland vegetation (Chapter 1, Reduce the Amount of Early Successional Forest). This is more than double the amount desired (up to 10%) in the 2B area. Because of this, the proposal (Alternative 5) was developed to aggressively address the need to reduce early successional habitat. Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). It takes a less aggressive approach to conversion of early successional habitat to late successional habitat. Because of the age of the existing aspen, none of the alternatives reduce the percentage of aspen substantially. Aspen still remains above 20% of the existing upland in all alternatives (Chapter 3, Forest composition). Also see response to comments 9 and 11b. Also see Chapter 3, Early successional wildlife and Appendix C, Regenerating Aspen MIH. Also, the commenter misread the proposed action table regarding the conversion of early successional species. In Alternative 5, the proposed action, 1,489 acres are proposed for early successional species treatments; however, only 541 acres of that would be maintained as early successional species and the remainder would be maintained in mid to late successional species. Alternative 4 has 1,137 acres of early successional species treatments, which would result in the retention of 670 acres of early successional species (Chapter 2, Table 8: Alternative Comparison Table). About 470 acres of paper birch stands have been proposed for treatment. The amount of treatment in this type does not change substantially by alternative. Of these acres, about 150 acres

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	across the Forest and we feel is not being monitored adequately at the Forest level. For example, aspen harvest levels have been below Forest Plan goals for the last 21 years! To now attempt to meet 2004 Forest Plan goals, without considering what has NOT been happening across the Forest over that time period, seems ludicrous. The Society also is disappointed with the amount of paper birch being converted to long lived conifer and northern hardwoods in this proposal. While at the upper end of the MA 2B goal, this species is struggling to survive on the Forest and management efforts are definitely needed at this time to retain this important forest type. Like aspen, the Park Falls District has some of the best opportunities to maintain this forest type. Please reconsider the amount of paper birch identified for conversion.		would be treated to maintain paper birch. About 60 acres would be treated for conifer conversion. Paper birch stands proposed for converting to a conifer forest type are due to the existing condition of the stand. These stands have an established understory of conifer which could be released from the paper birch overstory and managed as the future stand. The remaining paper birch being treated already has a significant component of other hardwoods and may be adjacent to 8E, F, and G areas where maintenance of early successional habitat is not generally considered complementary management.
27b	We do support the regeneration harvests in 369 acres of aspen to improve age class distribution of this important forest type. However, once completed this harvest level will only result in around 6% of the existing aspen in the project area in the 0 – 10 year age class, well below the Forest Plan's 20% target goal. We encourage a relook for additional opportunities to better reach this target level in the Project Area. As you are aware, in the fall the Park Falls District is a popular destination for ruffed grouse and woodcock hunter's from all across the country because of its availability of accessible public land that includes the young forest habitat component utilized by these species. Rather than significantly reducing the aspen levels in the Park Falls Hardwoods Project, to "meet MA objectives", this area more than any other MA 2B area on the Forest may be a location to attempt to maintain existing aspen levels that are higher than others. We feel there are opportunities to maintain additional young forest habitat adjacent to other public lands that are being managed for early successional habitats at this time including the Price County Forest lands to the west and south of the Project Area and the Oneida County Forest lands and industrial lands to the east. Maintaining those compatible early successional habitat blocks will still allow the interior of the project area to better address MA 2B goals. As noted earlier, the Park Falls District is very important to hunters, especially upland game hunters. These hunters add to the economy of the area each fall. This proposal, especially if the significant reduction in early successional acreage occurs as proposed would negatively impact the area from this perspective. The ruffed grouse in particular is an extremely popular game bird that draws hunters in the fall from all over the nation to northern Wisconsin. The Wisconsin DNR reported that between 100,000 and 150,000 people hunt ruffed grouse annually in Wisconsin. Most of this hunting occurs in the northern part of the state where the Wisconsin National Forests are located. Obviously any significant decrease in ruffed grouse or woodcock populations would create quite an impact in this region. The public needs to be kept appraised of the direct and indirect effects of this proposal to hunters and the local economy. Young forests are extremely important to regional biodiversity. Not surprisingly, many wildlife species dependent upon young forest habitats are experiencing population declines as a direct result of the ongoing maturation of eastern deciduous forests. Smith et al. (1993) found that 76% of the neotropical migratory birds that are experiencing significant population declines in the eastern US require grassland or young forest/shrub habitats. Probst and Thompson (1996) reported that of 187	Alternatives and Early Successional Species Issue	The Forest Plan provides the overall guidance for land use management decisions of the forest. While it is known that acres of aspen forest are declining across the landscape particularly in the Lake States of Michigan, Minnesota, and Wisconsin; this is not a new phenomenon and these trends have been documented for decades (Leatherberry and Spencer 1996). The Forest Plan Record of Decision documents the decision to continue to decrease aspen acreages across the CNNF. The Forest Plan predicted aspen acreage to drop from the 336,100 acres (29.8% of upland acres) in 2000 to 216,200 acres (19.2% of upland acres) in 2100. By contrast northern hardwood acreage is expected to increase from 447,500 acres (39.7% of upland acres) in 2000 to 572,200 acres (50.7% of upland acres). The Forest Plan also defines themes for Management Areas (MAs) as well as allocates specific units of the forest to MAs. The Park Falls Hardwoods project is located primarily in MA 2B. This MA theme is for Uneven-aged Northern Hardwoods: Interior Forest (Forest Plan, 3-7 through 11). While some aspen regeneration is compatible with this theme it is in areas such as the Park Falls Hardwoods project area that the anticipated reduction of aspen acres would occur. Aspen still remains above 20% of the existing upland in all alternatives (Chapter 3, Forest composition). For additional information on how each alternative addresses the percentage of aspen in the younger age class (0-10 years old) see Chapter 3, Aspen age class). It is recognized that recreation plays an important role in the health of the Wisconsin economy particularly the rural forested areas. Marcouiller and Mace estimated that in 1996 over $5.5 billion was spent by Wisconsin households on goods and services associated with forest-based recreation and approximately $2.4 billion was spent within 25 miles of where the activities took place. Of this local area total it is estimated that quiet recreationists, hikers, bikers, campers and birdwatchers spent 49%, hunters spent 27% and motorized users spent 26% (Marcouiller and Mace 1999). Recent timber harvests on the Price County landbase of the CNNF

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	species of neotropical migratory songbirds that breed in the Midwest, 95 use shrub-sapling or young-forest habitats to some degree during the breeding season. The Ruffed Grouse Society recommends that the District's utilize these important factors as they continue to evaluate this management project. Please feel free to contact me if you have any questions. Thank you for your time.		have concentrated on aspen regeneration. Since 2005, 3,461 acres of all forest types on the Price County landbase have been treated through commercial timber harvest and 1,681 of these acres have been regenerated to aspen. While less than 30% of the upland acres of the CNNF are aspen approximately 49% of acres treated on the Price County landbase have focused on the regeneration of this species, with more to come in the upcoming Early Successional Habitat Improvement Project. More recently, there have been 670 acres of aspen regenerated in 2009 and 2010, with an upcoming 553 acres to be regenerated in the Camp Four project area, and overall there would 5,447 acres of aspen within the 0-10 age range across the Park Falls landbase. See the Wildlife Specialist Report and Chapter 3, Early successional wildlife. Aspen conversions within the Park Falls Hardwoods project area are both silviculturally and financially feasible. Current forest inventory data in these stands show components of red maple and sugar maple, as well as minor occurrences of basswood, ash, and yellow birch in 2-6 inch diameter size classes. Since these species are currently established, removal of a portion of the aspen overstory will encourage development of this hardwood component into the future forest type of the stands and recover value from the aspen that would be lost during natural succession. Early successional habitat and impacts to wildlife species is discussed in detail in the Wildlife Specialist Report for Park Falls Hardwoods and summarized in Chapter 3, Early successional wildlife. As stated in response to comment 27a, Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). Aspen still remains above 20% of the existing upland in all alternatives which is double the desired amount for the MA 2B.
28a	Ms. Darnell, the following are my comments on the proposed management for the Park Falls Hardwood project. •The effort to reduce ash trees in light of the impending emerald ash borer invasion is a well conceived plan and to be applauded.	Purpose and Need	Support for emerald ash borer treatments in the proposal. Chapter 3, Ash composition and forest resiliency to emerald ash borer, summarizes potential impacts.
28b	•I do question the reduction in early successional forest (aspen) however, many of these aspen stands have a component of ash in the understory and not maintaining them in aspen will push them significantly to ash and at this point in time that seems to be ill-advised.	EAB Issue Alternatives	Many stands proposed for conversion from aspen currently have a variety of northern hardwood species already established in the stand as seedlings, saplings and trees. They include sugar maple, red maple, basswood, white ash and yellow birch. Improvement cuts would be designed to retain an overstory to encourage development of more shade tolerant species. White ash could be expected to occur in these stands along with a more predominant

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			mix of hardwood species such as maple. It is not expected that ash will replace aspen in these stands. In addition, any upland stand with an existing ash component that is being treated would also be treated to reduce the density of the ash within the stand so that EAB will have less ability to rapidly build in population levels and spread. Also see the response to comment 26f for additional information on the Forest's EAB strategy and how it will be implemented in the Park Falls Hardwoods project. Also see Chapter 2, Alternatives Considered but Eliminated From Detailed Study.
28c	•The economic and wood fiber return of most of these aspen stands would be maximized if maintained in aspen. Encouraging the poorer quality soft maple that will grow on these sites with an ash component that will most probably be dying in the near future seems ill advised from both economic and environmental perspectives.	Outside of Purpose and Need, Alternatives	While it is true that economic and wood fiber returns would be larger over time by not converting aspen stands into hardwood stands, these trade offs were considered during the 2004 Forest Plan revision process. During the revision it was anticipated that aspen acreage across the forest would be reduced by nearly 120,000 acres during 100 years of implementation. The 2004 Forest Plan provides the overall guidance for land use management decisions of the forest. The Forest Plan ROD documents the decision to continue to decrease aspen acreages across the CNNF. The Forest Plan also defines themes for the MA as well as allocates specific units of the forest to MAs. The Park Falls Hardwoods project is located in MA 2B. This MA theme is for Uneven-aged Northern Hardwoods: Interior Forest (Forest Plan, 3-7 through 11). While some aspen regeneration is compatible with this theme, it is areas such as the Park Falls Hardwoods project area that the anticipated reduction of aspen acres would occur. Also see the response to Comments 27a and 27b.
28d	•This is one of most popular ruffed grouse hunting areas of Price County (Park Falls being the Ruffed Grouse Capital of the World) and I would like the aspen acreage to be maintained as if is very desirable ruffed grouse habitat.	Alternatives	Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species. Also see response to comments 27a and 27b.
28e	•I question the push to improve habitat for spruce grouse, I have personally hunted this area for 35 years and have never seen a spruce grouse, and it is already excellent ruffed grouse habitat and will remain so if the aspen on the landscape is maintained.	Purpose and Need	There was one spruce grouse documented in the project area in 2007. This species is losing habitat and has a very low overall statewide population. There are 24-60 acres proposed to enhance spruce grouse habitat which includes planting black spruce in a forested wetland area, and harvesting in a small area of a hardwood stand to encourage white spruce retention and regeneration. Neither of these small projects are expected to impact ruffed grouse habitat. For impacts on spruce grouse, see Chapter 3, Spruce grouse. For impacts to ruffed grouse habitat, see Chapter 3, Early successional wildlife.
28f	•I agree that maintaining the coldwater fisheries is important and following Wisconsin BMP's for water quality will insure that those fisheries are maintained.	Purpose and Need, Standards	Support for maintaining coldwater fisheries. Wisconsin State Best Management Practices for Water Quality (BMPs) are built into the proposed action and all of the action alternatives.

Table D2: Comments and Response to Comments on the Proposed Action				
Comment Number and Comment			**Response or Response Outline**	
			and Guides	
28g	•The logging activity will insure the recreating public has improved access into the area. Thank you for the opportunity to comment. If you have any questions, please contact me.		General Access Issue	The logging activities are not designed to improve access to the area. However, two of the other actions in this project were developed to improve public access. All action alternatives include almost 6 miles of walking trail designation and an increase in the amount of roads open for public motorized use (wheeled vehicle travel) from about 1.04 miles per square mile to about 1.3 miles per square mile (Chapter 3, Transportation and Walking trails).
29a	(paraphrased from phone conversation) He questioned the amount and locations of permanent road construction. Again he indicated that he would be happy to consider allowing us access from his property if that would eliminate any road construction.		Permanent Road Access Issue	Forest Service policy provides guidance for actions taken by field units such as the Medford-Park Falls Ranger District. Current road and trail right of way policy includes; "Consider accepting temporary agreements, road use permits, or road rental arrangements only for immediate, temporary, limited access and when future needs of the United States do not justify the expense of providing a permanent road or trail." When a transportation analysis indicates that permanent long term access is needed into an area for public access or harvesting resources the agency is directed to acquire permanent access through acquisition from private landowners or development of alternate access across government property. Permanent roads are needed when entry into an area is ongoing or recurring on a short interval. For instance, for the management of northern hardwood forest types. Since permanent long term access is needed; the temporary agreement that Mr. Ryf offered would not be appropriate.
29b	(paraphrased from phone conversation) Mr. Ryf indicated that he had reviewed the proposal sent to him and was glad to see the closures and road decommissioning as well as designated routes for ATVs. Had some questions on the short spurs the proposal shows as open to ATVs. I indicated that the spurs were to allow ATVs to get off the main roads and legally park or camp off the main roads… He also indicated that he had a pit run gravel source on his property which he could sell to us. I let him know that I would forward this information to our engineering and minerals staff. He said he was glad that the Forest Service was managing the area as well as protecting some of the features that he considers special such as large white pine and hemlock. Mr. Ryf expressed some concern about allowing ATVs off of designated trails/routes as well as potentially impacting areas designated as 8 E, F, and G. He has used the project area for many years and feels that our plans are worthwhile as long as we are stewards and minimize potential damage such as rutting, impacts to streams, etc. He again expressed an interest in receiving the draft EIS.		Purpose and Need Standard law enforcement procedures.	General support for the project. ATV use will not be allowed off of designated trail/routes as a part of this project. Illegal ATV use often results in resource damage and has been an ongoing law enforcement issue throughout the National Forest. The commenter is on the mailing list to receive a copy of the draft EIS.
30a	Will you be widening FR 503 to accommodate the truck traffic since there is hardly enough room for 2 vehicles to pass? We live on FR 503 and this will be an inconvenience. After the truck traffic destroys our road, will it be repaired by the project? The amount of traffic – heavy	Road Maintenance standard procedures.	Forest Service timber sale contracts contain provisions that require timber sale purchasers to perform road maintenance commensurate with use. This means that any damage sustained on a road used for timber haul must be repaired by the timber sale operator. The Forest Service also collects deposits on all timber sales for the use of roads maintained by the Forest Service. These deposits are used to repair roads where damage is not immediately attributable to timber haul. These deposits are often used to periodically grade roads or replace surfacing materials.	

Table D2: Comments and Response to Comments on the Proposed Action						
Comment Number and Comment				Response or Response Outline		
	truck traffic – will definitely cause problems with the road.		The Forest Service has agreements with townships to cooperatively perform road maintenance of town roads such as FR 503. Such cooperation includes engineering services, material sources, or cooperative construction services. Townships receive gas tax monies to maintain town roads under their jurisdiction. Town roads used for timber haul will remain open to the public during the life of timber sale contracts. With the exception of road weight restrictions normally imposed during spring thaw, no other restrictions are anticipated. No improvements are planned for town roads as a result of this project.			
30b	When adding walking trails, are the areas where wolves and other predators are located being taken into consideration?	Human Safety Issue Related to Forest Predators.	Wolf and other predator attacks on humans are tremendously rare. There have not been any documented attacks on humans by wolves or coyotes in the state of Wisconsin for over a hundred years. There is likely not any piece of woods in the state where predators such as wolves, coyotes, bobcat, fisher, and so forth don't move through. There is no evidence that walking on trails in or near near wolf areas exposed people to any more risk. Thousands of people walk the trails, woods roads, and old logging roads of the National Forest in wolf range every year especially in fall, without any adverse human/wolf incidents (Wydeven 2011). Known wolf denning and rendezvous locations would be considered when placing facilities such as roads or trails in an area; however, there are no specific known denning or rendezvous locations in the project area (Appendix C, Federally threatened – Eastern gray wolf).			
31	The proposal calls for a large non motorized area in addition to the non motorized area of MA 6B. Since access is denied to motorized users, the area should have more opportunities for recreational access than what is currently proposed by providing more multi-use hiking/mountain bike trails. These trails could serve as a back-country type ski or snow shoe trails in winter. I would envision these trails being narrow paths and not a wide trail that gets grown over with grass and needs mowing. Without a trail system, the non-motorized area between FR 130 and FR 132 seems to be an area that would not be utilized much ;by the public. Thank you for considering my comments.		General Access Issue	All non-motorized areas found within the Park Falls Hardwoods project area were established by the 2004 Forest Plan. No additional non motorized areas are proposed in this project. This project addresses these areas as existing MAs. Due to the soil type and wetlands found within the Stoney Creek Non-motorized area, construction of a non-motorized trail not utilizing existing road beds would not be ecologically sound. Non-motorized trail designation in the Elk River SPNM was done using existing road prisms. By taking advantage of these existing road prisms we are able to limit any ecological impact in terms of soils and wetlands.		
32a	The Great Lakes Timber Professional Association (GLTPA) headquartered in Rhinelander Wisconsin represents nearly 1,000 forestry professionals from Wisconsin and Michigan. These professionals range from loggers to truckers to equipment manufacturers, foresters, land owners and consumers of forest products like paper mills and sawmills. On behalf of its members the GLTPA would like to offer the following comments for Park Falls Hardwoods Management Project. GLTPA fully supports proper management for hardwood stands in Management area 2B. Northern hardwood silviculture is extremely important to this region for many reasons both socially and economically. Many of the manufacturing facilities located throughout Wisconsin and Michigan are dependent on a continuous supply of log grade and hardwood pulp material from the trees grown in the CNNF. There is also a growing demand for woody biomass material to support new and emerging businesses which will help reduce our nation's dependence on foreign oil. Proper management is needed to ensure an uneven aged structure which will support the long term sustainability of those forests, and will also help to stop the spread of disease, invasive species and the potential risk of fire.				Purpose and Need	Supportive comment related to the purpose and need for the proposal.
32b	Although we do support all management activities we do have concerns about the reduction in aspen acres in the project area. There are several industries in this region that are dependent on early successional species such as aspen to maintain their economic viability. As you may know the Park Falls region is considered to be the "Rough Grouse Capitol" of the world and any reduction in aspen management will not only have grave effects on the forest products industry, but the tourism industry as well. The local communities within and surrounding the boundaries of the CNNF are		Purpose and Need, Alternatives	As stated in response to comment 27a, Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). Aspen still remains above 20% of the existing upland in all alternatives which is double the desired amount for MA 2B. Also see the response to		

Table D2: Comments and Response to Comments on the Proposed Action					
Comment Number and Comment			**Response or Response Outline**		
	dependent on proper management activities which support jobs, recreation, clean air and clean water and it is our expectation that these concerns will be given full consideration as we move forward. We sincerely appreciate the opportunity to comment on the proposed actions for the Park Falls Hardwoods Project and look forward to receiving the DEIS.			comment 27b for information on the overall amount of aspen management occurring on the Park Falls landbase of the CNNF.	
33a	Thank you for the opportunity to comment on the proposed actions on the Park Falls Hardwood Project. The Department of Natural Resources spent considerable time and expense in evaluating and commenting on the CNNF Forest Plan revision. We are generally supportive of projects that implement the revised plan. Management of the Chequamegon-Nicolet National Forest (CNNF) is critically important to Wisconsin, and in particular, the rural areas of Wisconsin in close proximity to the forest. The purposes and goals of the Park Falls Hardwood project appear to be generally in line with the Forest Plan direction and the forest-wide standards & guidelines. However, we do have questions in a few areas and would appreciate their consideration and inclusion in the DEIS. The CNNF Forest Plan (page 2-14) references guidelines for downed woody debris retention as well as reserve tree guidelines. Further, pages 3-10 and 3-11 highlight guidelines specific to Management Area (MA) 2B. What seems to be lacking is direction for application of biomass guidelines on whole tree harvesting and ensuring that soil productivity is maintained. Discussions with U.S. Forest Service staff indicate that there will likely be intent for the CNNF to follow the Wisconsin's Forestland Woody Biomass Harvesting Guidelines (Pub. FR-435-09) developed in 2007-08. I know the U.S. Forest Service was an active participant in the Biomass Advisory Committee formed to assist in the guideline development. Please include discussion in the project DEIS pertaining to either these guidelines or what alternative approach will be used to ensure site productivity.			Standards and Guides	Wisconsin's Forestland Woody Biomass Harvesting Guidelines will be implemented with this project. See Chapter 3, Soils section for additional details on site productivity. It should also be noted, that while whole tree harvesting may be allowed in some clearcuts and in some alternatives, because of the potential damage to residual trees, whole tree harvest operations would not generally be allowed in selection harvests and thinnings. See Appendix E biomass treatment descriptions and biomass harvest restrictions. Also see response to comment 26i.
33b	Discussion in the project proposal mentions altering silviculture to reduce the percentage of large ash within those areas to be harvested as a means of preparing for emerald ash borer (EAB). In the DEIS it would be helpful to add detail to better describe what parameters will be used in the harvest strategies and what the intended benefits are. Most wetland forest types on the CNNF were declared "unsuitable" for harvest in the Forest Plan. In the DEIS it would also be appropriate to include the intentions for lowland areas dominated by ash and what the anticipated consequences of that management (or lack thereof) are. There are concerns about potential EAB buildups in lowland areas and the impacts of those on upland stands and adjacent ownerships.	Purpose and Need	A broader discussion of how the CNNF Ash Management Strategy relates to the Park Falls Hardwoods project has been included in the EIS and potential impacts of each of the alternatives related to the potential spread of EAB can be found in Chapter 3. As a summary, to prevent an EAB infestation silviculturally, The Ash Management Strategy for the CNNF, signed on June 5, 2009 by the Forest Supervisor directs staff to design vegetation treatments that will reduce potential EAB food source (ash phloem). Silvicultural treatments will be most effective if applied prior to an infestation. Reducing the amount of phloem in the stand is expected to reduce the potential build-up of local EAB populations. This is a "slow the spread" approach. The strategy will be applied on all upland mixed hardwood stands and selected key lowland hardwood stands (with a black ash component). The objective is to reduce the phloem in upland and only a small selection of **key** lowland stands thereby affecting the potential population build-up and allowing natural predators to play a role in reducing EAB populations while also providing more time for other possible treatments and / or strategies. These stands are not pure ash stands. Standard silviculture treatment guidelines will be applied to maintain adequate residual basal areas, encourage a diversity of species and reduce EAB's food source. Some of the treated stands in each alternative are wetland forest types described as unsuitable for timber production in the Forest Plan. The intent is not to manage these areas for wood products, but to reduce an EAB pathway and food source into areas that could be devastated by an EAB infestation. See Chapter 3, Ash composition and forest resiliency to emerald ash borer.		
33c	Lastly, there is some minor planting to reestablish yew in this project. In the DEIS please elaborate on whether this is a local genotype or a hybrid, and the purpose for			Standards and Guides	Forest direction includes using local or regional plant variants when planting. Chapter 1 includes the purpose and need for

Table D2: Comments and Response to Comments on the Proposed Action					
Comment Number and Comment			**Response or Response Outline**		
	planting.		planting yew in the project area.		
33d	The Department is very supportive of the landscape scale considerations for this project. The conversions to long-lived types and planning associated with minimizing fragmentation of the larger hardwood blocks are appropriate for this area of the State. Regenerating a small acreage of aspen appears to be a reasonable compromise for addressing the age class imbalance of aspen without drastically retarding the movement toward the desired aspen percentage within MA2B. These actions fit well with the purpose and need for the project. We are glad to see the diligence in pursuing activities that implement the approved land management plan on the CNNF. Thank you for the opportunity to comment. We look forward to the DEIS on this project and continued collaboration in the sustainable management of Wisconsin's forests.			Purpose and Need	Supportive comment related to the purpose and need for the proposal.
34a	Wisconsin County Forests Association (WCFA) represents the 29 counties in Wisconsin with county forests established under sate statutes §28.10 and 28.11. Collectively these counties manage nearly 2.4 million acres of forestland, the largest public ownership in our state. Several of our county forests are adjacent to or near to the Chequamegon-Nicolet National Forest (CNNF). WCFA supports the majority of the management objectives outlined for the Park Falls Hardwoods Project. We appreciate that the primary purpose of the project proposal is to implement management activities contained in the CNNF Land and Resource Management Plan. It is important to both the CNNF and adjacent landowners to maintain our forests in a healthy, vigorous condition. Proposed actions will work towards achieving that purpose. We fully support the management objectives for hardwood stands in Management Area 2B. Proper northern hardwood silviculture is important in achieving an uneven aged structure in those stands. As outlined in your proposed action document, much of this area has had minimal active management for over 20 years. The longer this area goes without proper forest management, the more potential there is for forest health issues to become prevalent. If the stands remain untreated it will be extremely difficult to achieve uneven - aged conditions.			Purpose and Need	Supportive comment related to the purpose and need for the proposal.
34b	We are somewhat concerned with the objective to drastically reduce aspen acres in the project area. Acres of aspen forest are declining across the landscape. This early successional species is important to many wildlife species, both game and non-game. The lake states play an important role in working to maintain aspen on our landscape. Ruffed grouse is one game species reliant on aspen. Price County and the surrounding areas are well known for the ruffed grouse hunting opportunities they offer and hunters have an influence on local economies. We encourage you to consider maintaining more of the aspen component in the Park Falls Hardwood Project area.		Alternatives	As stated in response to comment 27a, Alternative 4 was developed primarily in response to public comments concerning the decline of aspen across the forested landscape in northern Wisconsin and the impacts that may have on early successional wildlife species (decline of regenerating aspen). Aspen still remains above 20% of the existing upland in all alternatives which is double the desired amount for MA 2B. Also see the response to comment 27b for information on the overall amount of aspen management occurring on the Park Falls landbase of the CNNF.	
34c	As an additional consideration, we are concerned with what forest types will replace the aspen stands in the short and long term. Your proposed action identifies balsam as a less desirable species, is there potential for balsam to move into these stands absent of aspen? Also we are concerned with the potential for ash to replace the aspen. In light of Wisconsin's situation relative to Emerald Ash Borer (EAB) we encourage you to consider maintaining aspen in some of these stands.	EAB Issue and Potential to Increase Ash Component with Treatments Alternatives	Many stands proposed for conversion from aspen currently have a variety of northern hardwood species already established in the stand as seedlings, saplings and trees. They include sugar maple, red maple, basswood, white ash and yellow birch. Improvement cuts would be designed to retain an overstory to encourage development of more shade tolerant species. White ash could be expected to occur in these stands along with a more predominant mix of hardwood species such as maple. It is not expected that ash will replace aspen in these stands. In addition, any upland stand with an existing ash component that is being treated would also be treated to reduce the density of the ash within the stand so that EAB will have less ability to rapidly build in population levels and spread. Also see the response to comment 26f for additional information on the Forest's EAB strategy and how it will be implemented in the Park Falls Hardwoods project. On upland hardwood sites, tolerant hardwood species would be expected to out-compete balsam fir. Balsam fir is expected to be an associated species rather than a		

Table D2: Comments and Response to Comments on the Proposed Action					
Comment Number and Comment			**Response or Response Outline**		
			dominant species. Also see Chapter 2, Alternatives Considered but Eliminated From Detailed Study.		
34d	It is stated that the proposed actions would result in "about 91 MMBF of pulpwood and sawtimber products and potentially 14,000 dry tons of topwood material". CNNF has a public obligation to support Wisconsin's important wood products industries. Rural communities surrounding the project area would benefit from the proposed action. The project area is within the procurement range of key biomass facilities that serve in our state's and nation's desire to become less dependent on foreign oil. We fully support the production of these essential forest products. Thank you for the opportunity to provide input on the proposed action for the Park Falls Hardwoods Project. We look forward to receiving the DEIS.			Purpose and Need	Supportive comment related to the purpose and need for the proposal.
35	I believe that the timber has to be harvested but there has to be a way to do it without all the road building going on in the forest. This whole area was logged off with horse and sleds. They didn't build roads to get the timber out to the railroads and there weren't many of them. It seems these modern loggers have to have a road within a ¼ mile of the trees they are cutting – this is unreal. Having hunted in the forest for over 60 years and saw how it was then and how it is now it sure went down hill with all the roads and trails being built and all the damage done by the ATVs and 4 wheel drive pickups on the grass covered trails that were turned into rocky washouts and mud holes. Now the forest service is graveling them to cover up all the destruction. If this road building keeps up soon it will be a "Forest of Roads and Trails" instead of a "Forest of Trees".		General Impacts of Roads. Alternatives	Specific to the CNNF, historic logging operations and homesteaders developed a number of roads comprising the existing road system before land was first purchased by the government in the 1930s. Some of these old road corridors were utilized repeatedly over the years for a variety of uses and were slowly reconstructed or constructed to form our present road situation. Even though the road system has been expanded by the Forest Service over the years to meet National Forest management objectives, a number of roads exist on the Park Falls Hardwood landscape that were inherited rather than planned. As a result, the present transportation system does not provide adequate administrative access to meet the project area needs. Also, this means that there are roads in the project area that are not useful for management of the project area. These roads are proposed for decommissioning. In all the action alternatives, total miles of road in the project area will decrease. More information on the expected changes to the transportation system can be found in the EIS, Chapter 3, Transportation.	
36	I did not get to comment, but Valley needs to be preserved. No further development for camping, etc. Treat preserve the way it is. Also, save a few nice stands of mature trees so people can see what a mature forest looks like.		Purpose and Need	There are no plans for recreation development being proposed except for the conversion of some existing roads to trails. The primary purpose and need for this project is to enhance / maintain mature forest.	

APPENDIX E – PROJECT DEFINITIONS / DESCRIPTIONS AND PROJECT DESIGN MEASURES

This appendix includes project definitions and descriptions and a table that identifies Forest Plan standards and guidelines that are applicable to the projects identified for each alternative. Also included are any additional design features or mitigation measures that are more specific to the projects than Forest Plan standards and guidelines. Standards, guidelines, and design features are an integral part of the alternatives and are meant to reduce or eliminate the environmental impacts of the alternatives.

Appendix F contains detailed tables which lists each treatment for each alternative and the measures that would apply to the specific treatment areas (vegetation treatments and road treatments).

Appendices E and F can be used in conjunction with the alternative maps in Appendix G to acquire site specific information about each treatment area in any of the alternatives.

Table E1 defines the seven general types of harvest treatments used in the Park Falls Hardwoods project.

Table E1: General Harvest Treatment Definitions

Code	Treatment Name	General Treatment Description
4113	Clearcut	A regeneration harvest method that removes essentially all trees in a stand, except for reserve trees left on site for management objectives other than regeneration. The result is a new age class of trees that grows following the harvest treatment.
4114	Salvage Clearcut	Same as a Clearcut except the precipitating factor for treatment is due to insect, disease or wind damage. The result is a new age class of trees.
4121	Shelterwood Preparation Cut	A harvest method which serves to encourage tree crown development of red oak thereby encouraging seed production. This treatment also serves to remove undesirable trees. The result is a residual stand of healthy and dominant trees which provide a natural seed source for the future.
4131	Shelterwood Seed Cut	A regeneration harvest method that removes essentially all trees except for widely dispersed trees specifically retained for seed production. The result is a new age class of trees.
4143	Overstory Removal Cut	A stand replacing harvest method that removes a mature overstory of trees and releases an already established understory of trees. The understory is typically a different forest type. An example is aspen overtopping conifer or hardwood trees.
4151	Individual Tree Selection Cut	A regeneration harvest method that removes individual trees of all sizes throughout a hardwood stand. The objective is to promote growth of remaining trees and provide space for regeneration. The result is a matrix of uniformly spaced overstory trees and regeneration gaps of 60 feet or less. As this type of treatment is repeated in the same area, trees of a variety of ages are represented within the stand.
4195	Shelterwood Removal Cut	A removal harvest of the overstory which occurs after residual seed trees have served their purpose of providing seed for a new stand of trees. The result is new age class of trees growing in open conditions and free from overstory light competition.
4210	Improvement Cut	An intermediate harvest which removes trees of any species in a stand for the purpose of improving species composition and quality based on management objectives. The result is a residual stand of mixed species.
4220	Thinning Cut	An intermediate harvest for the purpose of reducing stand density to improve growth, enhance forest health and improve spacing. The result is a residual stand of healthy dominant trees.

Table E2 further defines the vegetation harvest treatments. The 7 general harvest treatment categories are expanded to 17 categories which include information on regeneration treatments. These categories describe the silvicultural prescriptions which have been applied to each stand identified for harvest.

Table E2: Detailed Harvest Treatment Prescriptions

Treatment ID	Prescription
1 **Salvage Clearcut** White Spruce	White spruce stands in need of a salvage clearcut due to Spruce Decline. Aspen regeneration is anticipated due to the component of aspen within the stands. A conifer tree species (spruce, red pine or white pine) may be hand planted for diversity. Seedlings would be hand scalped and planted on 10 x 10 foot spacing.
2 **Salvage Clearcut** Blowdown Trees	This aspen stand contains a significant amount of blowdown timber and is need of a salvage clearcut. The stand will regenerate to aspen.
3 **Shelterwood Seed Cut**, Paper Birch	Mature paper birch stands will be treated with a shelterwood cut to reduce canopy closure to approximately 30%. Mechanical site preparation will be needed after leaf fall to control competing vegetation and prepare seedbed. Overstory removal will occur after desired regeneration is approximately one foot tall. Season of operation for final harvest is winter.
4 **Shelterwood Removal Cut (with reserves)** Early Successional species conversion to conifer	**Shelterwood Removal Cut (with reserves) Paper Birch conversion to Mixed Pine** – Mature paper birch stand will be treated with a shelterwood removal cut to release established regeneration of balsam fir, white pine and hemlock. Residual crown closure will be approximately 10-20%.
	Shelterwood Removal Cut (with reserves) Paper Birch conversion to Long-lived Conifer – A mature paper birch stand will be treated with a shelterwood removal cut to move an early successional forest type to the mixed pine type due to proximity to a reference area. Planting of red and white pine will be completed to meet stocking requirements and improve species diversity. Residual crown cover may range from 10-20%. Mechanical site preparation, salmon blade, will be used to control competing vegetation and prepare planting site. Trees will be hand planted on 8x8 spacing.
	Shelterwood Removal Cut (with reserves) Aspen Conversion to Mixed Pine – Mature aspen stands will be treated with a shelterwood removal cut to move an early successional forest type to the mixed pine type. An existing conifer component will be retained. Planting of red and white pine will be completed to meet stocking requirements and improve species diversity. Residual crown cover may range from 10-20%. Mechanical site preparation, salmon blade, will be used to control competing vegetation and prepare planting site. Trees will be hand planted on 8x8 spacing.
5 **Shelterwood Preparation Cut**, Oak	Oak stands, which have not reached rotation age, will be treated to improve the crown condition and seed potential of selected residual trees in preparation of the shelterwood seed cut. Residual crown closure will be approximately 80%. Following the 2009 Ash Management Strategy for the Forest, marking would focus on the largest ash in the stand and any retained ash would be in the smaller size classes.
6 **Overstory Removal** Conifer Retention	The overstory of mature paper birch stands will be removed to release an established understory of conifer, primarily balsam fir. Regeneration is 12 feet or taller.
7 **Overstory Removal** Hardwood/Conifer Retention	The overstory of mature balsam fir stands will be removed to release an established understory of mixed hardwood species and conifer. Regeneration is 12 feet or taller.
8 **Individual Tree Selection** Northern Hardwood	Hardwood stands will be selectively marked for harvest to reduce stand density, remove undesirable tree species and promote growth on residual trees. In pole size hardwood stands, residual crown closure will be 75-80%. In sawtimber size stands, residual crown closure will be 80%. Canopy gaps will be created in all stands to initiate a new age class. Four to eight 25 to 40 foot gaps per acre will be created by harvesting groups of pole sized trees or 1-2 large crowned trees. Species diversity will be encouraged in stands. Stands with mid-successional species (red oak, white ash, basswood, yellow birch and black cherry) will be encouraged through the use of one 60-foot gap for every two acres. Following the 2009 Ash Management Strategy for the Forest, selective marking or canopy gap creation would focus on the largest ash in the stand and retained ash would be in the smaller size classes. In stand 154, 017 focus will be to improve spruce grouse habitat by keeping spruce, encouraging spruce

Table E2: Detailed Harvest Treatment Prescriptions		
Treatment ID		**Prescription**
		regeneration, and breaking up thick balsam fir regeneration. In stand 139, 018 Canada yew plants will be fenced and supplemental planting of yew will takes place. In stands, 128, 026; 131, 013; 131, 048; 139, 033; and 148, 005 yew plants will be protected with slash following harvest. Slash will be strategically placed around yew to discourage browsing. Location of canopy gaps will be away from existing or planted Canada yew populations or individual plants. Yew sites will be monitored yearly for 5 years following project completion. Monitoring is to test the effectiveness of slash piling versus fencing for limiting deer browse and also for planted yew survival success and to detect any natural reproduction.
9	**Improvement Cut**/Paper Birch Conversion to Red Maple	These paper birch stands are successionally moving toward a hardwood mix either it is mostly red maple or a mix of hardwood species. The stands will be treated with an improvement cut to improve species composition and quality. Residual crown cover may range from 60-80%. Following the 2009 Ash Management Strategy for the Forest, selective marking would focus on the largest ash in the stand and retained ash would be in the smaller size classes.
10	**Improvement Cut**/Aspen Conversion to Red Maple with Diversity Planting	This aspen stand is associated with red maple and black ash. Following the 2009 Ash Management Strategy for the Forest, the ash would be treated as a risk tree and marked for removal. Because of the low species diversity in the stand, red oak and white pine will be hand scalped and underplanted for diversity on 10 x 10 foot spacing in areas scattered throughout the stand. Small openings in the canopy will be made to facilitate the partial shade requirements of white pine and red oak. Retaining a portion of the aspen canopy is desirable to reduce the potential of sprouting. Residual canopy cover may range from 50-80%.
11	**Improvement Cut**/Aspen Conversion to Mixed Hardwoods	These aspen stands have been identified for conversion for a number of reasons includeing being located within large hardwood blocks, the need to connect smaller hardwood stands to create larger blocks, adjacency to trout streams, adjacency to reference areas or because they already contain mixed hardwood species. Treatment would remove less desirable trees to improve species composition and quality. The improvement cut would favor existing hardwood species and development of conditions suitable for hardwood regeneration. Following the 2009 Ash Management Strategy for the Forest, the ash would be treated as a risk tree and marked for removal. Residual canopy cover may range from 60-80%.
12	**Improvement Cut** Balsam Fir, Conifer, or Aspen/Conifer Mix	These conifer dominated stands will be thinned to improve spacing and remove undesirable trees to improve composition and quality. The residual stand will remain conifer dominated. Residual canopy cover will average 80%. Supplemental planting will be achieved through hand scalping and hand planting on 10 x 10 spacing. Following the 2009 Ash Management Strategy for the Forest, marking would focus on the largest ash in the stand and any retained ash would be in the smaller size classes.
13	**Improvement Cut** - Balsam Fir and Aspen/Conifer Conversion to Mixed Hardwood	These early successional stands will be converted to mixed hardwood stands through an improvement cut to favor existing hardwood species. Residual canopy cover will average 80%. Following the 2009 Ash Management Strategy for the Forest, marking would focus on the largest ash in the stand and any retained ash would be in the smaller size classes.
14	**Improvement Cut** Lowland Hardwood Diversity	These lowland hardwood stands contain a component of black ash. The objective is to improve species diversity in anticipation of Emerald Ash Borer and the associated sudden loss of ash from forested stands. These stands will be thinned and large diameter ash will be targeted for removal, following the 2009 Ash Management Strategy for the Forest. Supplemental planting of either black spruce or tamarack may be prescribed for diversity. The trees would be hand scalped and hand planted on 10 x 10 foot spacing. Residual canopy cover will average 80%. In stands 153, 001; 153, 019; and 154, 034; black spruce would be planted to improve spruce grouse habitat.
15	**Commercial Thin** Red Pine and White Spruce	Theses stands will be treated to improve growth, quality, health and composition of red pine and spruce plantations. Residual basal area will be reduced to "B" line stocking level (100-120 square feet/acre) by removing approximately 30-40% of overall tree density. Residual canopy cover will be approximately 60-80%.

Table E2: Detailed Harvest Treatment Prescriptions	
Treatment ID	**Prescription**
16 **Clearcut**, Aspen	These stands will be treated by removing the majority of the overstory to encourage natural aspen suckering and a new age class of trees. Residual canopy closure will be 0-10%.
17 **Clearcut**, Aspen with Conifer Retention and some with Supplemental Planting of White Spruce	These stands will be treated by removing the majority of the overstory to encourage natural aspen suckering and a new age class of trees. Reserve trees will be focused on conifer species. If additional diversity is needed, supplemental planting may be used by hand scalping and hand planting on 10 x 10 spacing. Residual canopy closure will be 0-10%. The prescription for stand 143, 014 would be modified to encourage hardwood regeneration on the northwest side with strategic placement of reserve trees and islands. There would also be a 100 foot leave strip adjacent to the mature ash in the northeast. In order to reduce potential for EAB to establish in the RNA prior to effective treatment strategies, ash trees could be removed from this leave strip. The intent would be to leave the mature aspen and other species to maintain a mature canopy in this 100 foot strip. The southern portion of the stand would be treated as proposed which was to maintain the spruce and remove the aspen.

Harvest prescriptions include the removal of trees in a given area. Unless further prescribed, only the portion of the tree down to 4" in diameter is removed from the area in a commercial harvest operation. The remaining tops of the trees are generally left in place. Because of the potential demand for fuel / biomass that could utilize the topwood of trees (branches of the harvested trees that are 4" or less in diameter), utilization of this topwood would be allowed (not required) in some alternatives and in some harvest prescriptions. The description of the biomass harvest that could be allowed is shown in Table E3. Biomass harvest is further subject to Forest Plan standards and guidelines and other additional design features. See Table E5 for a full list/definition of all the standards, guidelines and design features utilized in this project. Biomass harvest is not prescribed for all harvest treatments in all alternatives. See Appendix F tables to see where biomass harvest would be allowed.

Table E3: Biomass Harvest Prescriptions	
Harvest Types	**Treatment Descriptions when Biomass Harvest is Allowed.**
Clearcuts and other regeneration treatments resulting in a maintained conifer, aspen or birch stand.	Whole tree harvest is utilized. This allows removal of the entire harvested tree. Processing generally occurs at a landing.
All intermediate treatments such as thinning, selection, and other harvest treatments.	Fuel rod or topwood removal is utilized. This entails limbing and processing at the stump and removing the main stem from 4" diameter inside bark to approximately 1" diameter inside bark. The remaining fine woody debris (FWD) would be left at the stump.

Each alternative has different amounts of the treatments shown / defined in Table E4. Chapter 2 of this EIS shows those alternative treatment summaries. For site specific information on where each treatment occurs, see Appendix F.

Table E4 defines the types of road treatments used in the Park Falls Hardwoods project.

Table E4: Road Project Definitions	
Road Treatment	**Definition / Description**
Maintain	Activities that result in the basic upkeep of the road in its current condition. Some of these roads are already part of the identified Forest transportation system. Other roads to be maintained are existing roads that would be added to the Forest transportation system.
Reconstruct	Activities that result in improvement or realignment of an existing road.

Table E4: Road Project Definitions	
Road Treatment	**Definition / Description**
Reconstruct, Winter	Activities that result in improvement or realignment of an existing road. In the case of "winter" reconstruction, the road is only suitable for winter use or use when ground is frozen and would not be reconstructed to a standard that would maintain year round / all weather access.
Construct	Activities that result in the addition of a road to the Forest landscape. These roads would permanently add miles to the Forest classified road system.
Construct Temp	Activities that result in the addition of a road to the Forest landscape. These roads would not permanently add miles to the Forest classified road system and would be decommissioned following project completion.
Decommission	Activities that result in the stabilization and restoration of unneeded roads to a more natural state. At a minimum, decommissioning renders a road inaccessible by reclaiming the first 300 feet of the road and by removing and rehabilitating any stream crossings.
Convert To Trail	Activities that result in decommissioning an existing road and converting it to a trail. This could be converting it to a walking trail, or a motorized trail, such as a snowmobile trail.

Table E5 identifies the Forest Plan standards (S), guidelines (G), and other design features (M) that apply to specific alternative activities and that would be implemented as part of the alternatives.

Table E5: Applicable Forest Plan Standards, Guidelines, and Other Project Mitigation Measures (Design Features)	
	A. Water Resources (Plan pages 2-1 to 2-3)
	Watershed Protection and Management
M1a	Chapter 30 permit may be required for WDNR water quality compliance.
M1b	Storm water discharge permit may be required for WDNR water quality compliance.
M1c	Do not operate wheeled or tracked harvesting equipment within 50 feet of the ordinary high-water mark except on roads or at stream crossings.
M1d	Within 100 foot Riparian Management Zone; Use selective harvesting and promote long-lived species appropriate to the site.
M1e	Within 100 foot Riparian Management Zone; Harvesting plans should leave at least 60 square feet of basal area per acre in trees 5 inches DBH and larger, evenly distributed.
M1f	Within 100 foot Riparian Management Zone; Develop trees 12 inches DBH and larger.
	Riparian Areas
S5	Aspen patches will not be regenerated within 450 feet of selected Class I, II, and segments of Class III trout streams including their tributaries and spring ponds (see Appendix DD for a list of streams). Aspen patches will also not be regenerated within 300 feet of all other Class I and II trout streams including their tributaries and spring ponds. Manage vegetation within these zones for species other than aspen, preferably long-lived conifers and northern hardwoods. *For this project Elk, Foulds, and Little Willow systems have Aspen management proposed partially within trout stream buffers. These projects would need to maintain other species within 450 feet of Elk and Foulds and maintain other species within 300 feet of Little Willow.*
G6	Do not pile slash within or move slash into riparian areas. Keep slash out of lakes, stream channels, floodplains, and areas where it may be swept into streams, rivers, and lakes.
G10	Provide and maintain conifer thermal cover within riparian areas.
	Wetlands
G14	Minimize fill and maintain cross road drainage when wetland road and trail crossings cannot be avoided.
	B. Soils (Plan page 2-3)
	Soils
G16	Retain logging slash in place (limbing at the stump) where topsoil is less than one inch thick, or where organic matter is less than 2%. *This guideline is compliant with the "Do not harvest woody materials on dry nutrient-poor sandy soils" from the Wisconsin Forestland Woody Biomass Harvesting Guidelines.*
M16a	Retain tops and limbs (<4" diameter) from 10% of the trees in the general harvest area (e.g. one average-sized tree out of every 10 trees harvested). *This guideline is compliant with the "goal is to have 5 or more oven dry tons per acre of FWD on site following the harvest" from the Wisconsin Forestland Woody Biomass Harvesting Guidelines.*

Table E5: Applicable Forest Plan Standards, Guidelines, and Other Project Mitigation Measures (Design Features)	
M16b	Retain tops and limbs (<4" diameter) from 14% of the trees in the general harvest area (e.g. one average-sized tree out of every 7 trees harvested). *This guideline is compliant with the "goal is to have 5 or more oven dry tons per acre of FWD on site following the harvest" from the Wisconsin Forestland Woody Biomass Harvesting Guidelines.*
M16c	Remaining tops could be removed as follows: limbing and processing at the stump and removing the main stem from 4" diameter inside bark to approximately 1" diameter inside bark. The remaining fine woody debris would be left at the stump. *This guideline is compliant with the "goal is to have 5 or more oven dry tons per acre of FWD on site following the harvest" from the Wisconsin Forestland Woody Biomass Harvesting Guidelines.*
M16d	Retain logging slash in place (limbing at the stump) in all hardwood stands or stands to be managed for hardwoods. *This guideline exceeds the "goal is to have 5 or more oven dry tons per acre of FWD on site following the harvest" from the Wisconsin Forestland Woody Biomass Harvesting Guidelines.*
G18	Designate the location of roads, trails, landings, main skid trails, and similar soil disturbing activities. Stabilize disturbed sites during use and revegetate after use to control erosion.
G19a	Operate heavy equipment only when soils are not saturated or when the ground is frozen.
G19b	Operate heavy equipment only when the ground is frozen
	D. Biological Resources (Plan pages 2-3 to 2-4)
	Biological Diversity
G21	Promote and maintain long-lived conifer super canopy trees, especially white pine.
G25	Avoid modifying microclimate and microhabitat conditions within steep ravines, cliffs, talus slopes, and areas of exposed bedrock *(for protection of spreading woodfern habitat)*.
	F. Regeneration and Intermediate Treatments (Plan page 2-5)
	Regeneration and Intermediate Treatments
G35	Use tree seedlings or seed where seed source is known and produced from seed collected within the climatic zone in which they will be planted.
M35	Implement approved decisions for treatment of stumps to prevent annosum spread. Consider treating stumps with borax or the currently EPA registered product for annosum prevention in areas within 50 miles of annosum occurrence.
	G. Silvicultural Maintenance and Conversion of Forest Cover Types (Plan pages 2-5 to 2-13)
G42	Site preparation for natural aspen regeneration should reduce the site's average residual crown cover (2" in diameter or larger) to less than 5% (excluding reserve islands) within all Management Areas except 1B, 2A, and 2B. The average residual crown cover for site preparation for aspen regeneration with Management Areas 1B, 2A, and 2B (in instances where aspen is to be maintained) is allowed to approach 10% (excluding reserve islands).
G51	Do not harvest yellow birch within the northern hardwood ecosystem unless its density must be lowered to facilitate recommended residual basal area, its regeneration is facilitated with canopy gaps, nurse logs, and/or planting, and sufficient seed source remains to take advantage of regeneration opportunities.
G52	Retain butternut trees with more than 70% live crown, and when cankers affect less than 20% of the combined circumference of the bole and root flares. Retain butternut trees that have no cankers and at least 50% live crown. Dead or poor vigor butternut trees may be harvested. *Butternut currently documented in 1160002, but could be found in any northern hardwood stand. If found, this measure would apply.*
M52a	In addition, if butternut is encountered during sale layout, planned canopy gaps should be arranged to aid in butternut regeneration needs.
G53	Maintain shade on and around large boulders, 10 feet in diameter and larger, by not establishing canopy gaps near them.
G61	Reserve hemlock in northern hardwood prescriptions. The following are exceptions to this guideline: (1) Hemlock trees may be cut if they impede road or skid trail development, and (or) safety problems are improved; and (2) On the Medford land base, (LTAs 212Xd05 and 212Xe05) thinning of hemlock clumps within northern hardwood stands (greater than 10% hemlock) is allowed when there is established hemlock regeneration, or hemlock regeneration efforts are planned within or adjacent to these clumps. Where hemlock regeneration is established, it will be protected and encouraged through site-specific protection measures.
	I. Wildlife and Fish (Plan pages 2-14 to 2-17)
	Timber Harvest Reserve Areas and Reserve Trees*
G78	Limit harvesting or pruning in the red oak group to the period between October 1 and April 15 to reduce risk of oak wilt infections.

Table E5: Applicable Forest Plan Standards, Guidelines, and Other Project Mitigation Measures (Design Features)	
G118	Leave and protect existing downed logs greater than 10 inches in diameter (small end diameter) consistent with providing for management access (e.g. skid trails).
G120	Emphasize diversity, cover and (or) mast by reserving tree species such as hemlock, northern white cedar, white pine, red oak, American beech, hickory, ironwood, blue beech, yellow birch, paper birch and other species that may not have strong local or forest wide representation.
G121	Reserve the above-listed tree species in small clumps or islands of trees within clearcuts, overstory removal cuts, and other regeneration harvest areas.
G122	Reserve 2 to 5 live trees per acre greater than 11 inches in diameter, or select the largest trees available; and reserve variable size reserve islands/clumps that total up to ½ acre for every 10 acres managed with an even aged harvest.
G123	Reserve all dead snags and live den trees up to 10 trees/snags per acre, unless they present a safety concern. Emphasize the largest snags and den trees available. Those snags felled for safety reasons should be left on site as coarse woody debris wherever possible. Additional snags will be recruited from live reserve trees.
	Woodland Ponds - Ephemeral and Permanent
M129	If ephemeral ponds or permanent woodland ponds are found during project layout and design, implement the applicable Forest Plan guidelines (G129-G143, Plan page 2-15)
	Upland Wildlife Habitat Management
G145	Provide for an average of one ruffed grouse drumming log for every 10 acres of aspen clearcut. The log should be 10 inches or more in diameter and at least 12 feet long.
	Aspen and Beaver Management
G158	Convert from aspen to long-lived conifers and northern hardwoods within 300 feet of all Class I and II trout streams (and their tributaries including spring ponds) and 450 feet of "selected" Class I, Class II, and segments of Class III trout streams and their tributaries including spring ponds (See Appendix DD for a list of selected streams). *For this project Elk, Foulds, and Little Willow systems have Aspen management proposed partially within trout stream buffers. These projects would need to maintain other species within 450 feet of Elk and Foulds and maintain other species within 300 feet of Little Willow.*
	K. Regional Forester's Sensitive Species (RFSS) (Plan pages 2-19 to 2-24)
	Regional Forester's Sensitive Species (RFSS)
G178	Vegetation management within 100 to 500 feet of RFSS plant and animal sites will be limited to practices that maintain or enhance habitat and micro-habitat conditions. Animal sites are defined as active nest, active den, or evidence of breeding activity. *For the Park Falls Hardwoods Project, a 100 foot no activity buffer will surround documented RFSS plant populations in stands proposed for harvest activity.*
	Northern Goshawk and Red-shouldered Hawk
G185	Protect active and historic nest sites. Within an area of at least 30 acres surrounding nest site(s), land use activities will be limited to those that do not reduce canopy closure or are necessary to protect the nest site for as long as the territory or stand is suitable habitat. No timber harvest will occur within the buffer area. Human disturbance will be minimized within the buffer from February 15 to August 1. *The identified stands are outside the nest buffer, but some sale or harvest activity still has the potential to impact areas outside the identified harvest boundaries.*
G186	Within a minimum of 330 feet of the designated 30-acre buffer area: Do not use even-aged management.
G187	Within a minimum of 330 feet of the designated 30-acre buffer area: Emphasize at least 80% crown closure with not more than 4 canopy gaps per acre up to 40 feet in diameter.
M187	Within a minimum of 330 feet of the designated 30-acre buffer area: No harvest activity from February 15 to August 1.
G188	Close roads and trails under Forest Service jurisdiction to vehicular traffic within 330 feet of a nest site from February 15 to August 1 unless no feasible alternatives exist and use can be justified.
G189	Conduct surveys for these species (northern goshawk and red-shouldered hawk) prior to projects being implemented within potential habitat areas. *Surveys may be needed within or adjacent to the identified stands. Check project file maps for specific survey area needed.*
	Spruce Grouse
M199a	Supplemental plant black spruce for spruce grouse habitat.
M199b	Emphasize white spruce retention and reproduction, and thin or reduce balsam fir "thickets" to enhance spruce grouse habitat.
	RFSS Plant Species Found in Forested Wetland Habitats
G224	Prohibit permanent or temporary openings within 100-500 feet of identified plant sites.
	L. Forest Health and Disturbance Processes (Plan pages 2-25 to 2-26)
	Non-Native Invasive Species

Table E5: Applicable Forest Plan Standards, Guidelines, and Other Project Mitigation Measures (Design Features)	
G234	Reduce the importation and movement of non-native invasive plant species across the Forests by taking the following actions: Avoid the placement of log landings in areas infested with non-native invasive plant species.
M234a	Include equipment cleaning contract clause to prevent NNIS introduction or spread (Forest Service Timber Sale Contract FS-2400-6T BT6.35).
M234b	Seed disturbed sites such as landings and skid trail with native or desirable non-native species (FSM 2081.03 1995) for all proposed activities that are risk for NNIS spread and establishment.
M234c	Treat NNIS infestations prior to activity
	N. Heritage Resources (Plan page 2-29)
	Heritage Resources
M262	Minimally, no project-related surface disturbing activity can occur within 30 meters of a cultural resource boundary. To ensure that recorded cultural resources are protected, those located within 100 meters of projects will be monitored by a sale administrator who will ensure that there will be no encroachment to the established buffered zones. If measureable damage is ever found to have occurred during a project, consultation with SHPO will follow with evaluation of the cultural resource.
G263	When heritage resources are discovered during Forest Service project implementation, all activities within the vicinity of the discovery area will cease until a professional archaeologist has made an on-site assessment of the discovery, and has consulted with SHPO, ACHP, and other interested parties regarding possible treatment alternatives.
	O. Scenery Management (Plan pages 2-29 to 2-33)
	Facilities- Roads, Trails, Recreation Use Areas, and Water Bodies
G280	Locate temporary openings: At least 100 feet from the perimeter or edge of recreation use areas, such as campgrounds and trail heads, and canoeable rivers.
G281	Locate temporary openings: No more than a 300-foot distance of temporary opening will be allowed along roads and trails. Such openings will be separated by a minimum distance of 500 feet and will occupy no more than 1,056 feet of each mile of road or trail.
G300	Planting within high and moderate SIO areas should be done in a non-linear pattern, within 100 feet of a travel corridor, use area, or water feature.
	Tree marking
G301	Apply tree-marking paint on the sides of trees that face away from travelways, use areas, and water bodies.
	Treatment of Residue from Timber Harvest or other vegetation removal activities
G302	Establish a 10-foot slash removal zone adjacent to travelways, use areas, and water bodies within high SIO areas, and where vegetation management activities have occurred adjacent to private land.
G303	Visible portions of timber harvesting or other vegetation removal areas should receive the primary emphasis for slash treatment.
G305	The following are non-motorized use area SIO slash height guidelines for visible area up to 150 feet from the edge of trails, recreation use areas, or water bodies: Moderate SIO= Slash Height less than or equal to 24 inches
G307	The following are motorized use area slash height guidelines for the visible area up to 100 feet from the edge of trails, use areas, water bodies, and Maintenance Level 5, 4, and 3 roads: High SIO= slash height less than or equal to 24 inches
G308	The following are motorized use area slash height guidelines for the visible area up to 100 feet from the edge of trails, use areas, water bodies, and Maintenance Level 5, 4, and 3 roads: Moderate SIO= Slash height less than or equal to 24 inches
G309	The following are motorized use area slash height guidelines for the visible area up to 100 feet from the edge of trails, use areas, water bodies, and Maintenance Level 5, 4, and 3 roads: Low SIO= Slash height less than or equal to 36 inches
	Temporary Openings
G310	Borrow from natural or man-made openings in the surrounding landscape, and follow natural boundaries to minimize straight-line opening edges.
G313	Visible temporary opening sizes adjacent to travelways, use areas, or water bodies in motorized and non-motorized settings are described below (the primary emphasis is the visible area in the first 200 feet from the travelway, use area, or water body): Moderate= 10 acres or less of visible opening size and 20 percent travelway or shoreline impacted.
G315	Establish reserve areas when there is a visual need to reduce the apparent size of a temporary opening.
	P. Administration (Plan pages 2-33 to 2-35)
	Special Uses, Rights-of-way, and utility corridors

Table E5: Applicable Forest Plan Standards, Guidelines, and Other Project Mitigation Measures (Design Features)	
M330	Plan harvest operations for these units for the 2013/2014 winter season. Consult with research special use permittee on any other needed requirements for these units (within footprint of the ChEAS research tower) prior to layout and contract design such as need for a one season contract.
	Q. Transportation Systems (Plan pages 2-35 to 2-38)
	Road Decommissioning and Landscape Restoration
S29	Decommission all temporary roads upon completion of authorized use (Standard, p2-36)
G353	Render a road inaccessible by reclaiming the first 300 feet (or the distance necessary to prevent viewing the road from an intersecting or adjacent travelway). This action may involve restoration of the natural topography, scarification of the roadbed (deep disking), utilizing erosion control measures, planting trees, and (or) placing natural obstructions (boulders, downed trees, etc.) in the road in such a way that they appear visually haphazard but effectively restrict access. Use a combination of closure devices, including but not limited to berms, boulders, and downed trees, when rendering a road inaccessible.
G354	Roads identified for decommissioning and made inaccessible may receive one of the following levels of landscape restoration: Minimum Level Restoration: Render roads inaccessible, remove stream crossings, and rehabilitate streambeds and banks. This level of restoration is typically applied to Maintenance Level 3, 2, and 1 dead end roads that have only minimally altered the landscape. The roadbed and clearing have few improvements and natural re-vegetation is likely to occur (little or no additional planting or seeding).
M354	The intent of decommissioning a road is to allow the road to return to its former land use or condition which is generally forested. Scarification of the road bed to reduce compaction may be needed to ensure natural revegetation or planting success. Scarification (following construction and use of a temporary road, or any road recently used, but no longer needed) should be included in sale contracts where decommissioning is required.
G355	Roads identified for decommissioning and made inaccessible may receive one of the following levels of landscape restoration: Moderate Level Restoration: Render roads inaccessible, remove stream crossings, and rehabilitate streambeds and banks. Remove road improvements that contribute to resource degradation and mitigate road improvements that alter the landscape. Moderate level road restoration measures include (but are not limited to) removing road surfacing (if salvageable), establishing erosion control measures on steep grades and cut and fill slopes, removing fill from wetland crossings, removing cross-drainage structures, and assisting re-vegetation where necessary.
	Road and Landing Locations, and access and skidding requirements
G366	When the only logging operations access alternative is from a gravel or paved road, the access road should have a gravel surface for the first 100 feet, unless it is used during frozen ground conditions.
G367	Locate landings a minimum of 100 feet from a collector road. Landings should not be located within the road template of an arterial or town road (including the ditch line and back slope). Landing location exceptions can be obtained with written permission from the township.
G368	Skidding should not occur on arterial or town roads.
	Roads Management and Related Soils and Vegetation Impacts
G370	Minimize road impacts by utilizing soil protection measures described in "Wisconsin's Forestry Best Management Practices Field Manual and "Wisconsin's Construction Site Best Management Practices Handbook". (Guideline, p2-38)
G371	Stabilize road cut and fill slopes using the most effective, natural-appearing, and cost-efficient methods available.
G373	Control erosion and effectively manage water flow on and adjacent to roads by providing adequate roadside and outlet ditches, ditch checks, and cross-drainage.
G374	Plant native or desirable non-native plant species where vegetative cover is needed to stabilize slopes or decommission a travelway.
G375	Insure, to the extent practicable, that road fill and gravel sources do not contain non-native invasive plant species.
	Guidelines for Management Area 2B (Plan pages 3-7 to 3-12)
G386	Restrict harvest on northern hardwood sites to frozen ground conditions.
G389	Retain long-lived conifers and hardwoods as reserve trees within aspen clearcuts. Where long-lived trees are not present—retain short-lived conifers if they are available.
G394	Reserve 4 to 9 live trees per acre larger than 11 inches. Focus on the largest trees available.
G395	Develop and retain trees over 24 inches in diameter to increase the probability of natural gap formation and tip-up mounds. The number of reserve trees over 24 inches in diameter should be included within the 4-9 reserve live tree total. Large (over 24 inches) basswood, ash, yellow birch, and red oak are preferred for retention.

Table E5: Applicable Forest Plan Standards, Guidelines, and Other Project Mitigation Measures (Design Features)	
G396	Emphasize the retention of long-lived conifers such as hemlock and white pine (as a component of the reserve live tree numbers). In addition, reserve other tree species that are not well represented in the stand or on the Forest (yellow birch, paper birch, red oak, white oak, American beech, etc.).
	Guidelines for Management Area 6B (Plan pages 3-32 to 3-36)
G483	Limit clearcuts to 10 acres and design them to maximize benefits for early successional wildlife species.
G484	Retain most of the long-lived northern hardwood and conifer large diameter trees (a diameter at breast height of 19 inches or more) within 200 feet of travel ways and use areas.
G486	Timber sales will be of appropriate size to be completed in about 3 years duration. Divide areas larger than 6,000 acres into two equal units. Apply the three-year duration to each sub-unit.